THE FARMERS' REGISTER.

VOL. VI. SEPTEMBER 1, 1838. No. 6.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE FREQUENT FAILURES OF THE WHEAT CROPS.

To the Editor of the Farmers' Register.

The successive failures of the three last crops of wheat, and the partial injury to the present, have caused a general inquiry, why this crop is more uncertain than in former seasons, and what remedy can be found for this misfortune, which threatens to destroy the cultivation of wheat, at least in Virginia. Being extremely partial to the golden grain, and thoroughly convinced that it ought to be the staple crop of the Old Dominion, I venture, as its friend, to give you some thoughts on the subject. Every candid observer must admit that the last four seasons have been very unfavorable—severe winters, and excessive rains in May and June. The present crop was very promising until the rains and exceedingly hot weather, which have created a good deal of rust in parts of the state, but still left a crop which will probably make us independent of foreign supplies.

Those causes have been beyond human control, and, so far as they are concerned, we can only submit to the decrees of an all-wise Providence; but it behoves us, as rational beings, to inquire whether there do not exist other causes, which may be removed by human effort.

There certainly is something very striking in the reflection, that a country always producing sufficient bread-stuff for its inhabitants since its first settlement, and latterly exporting more of that article than any other, should, with the view of affording a better home market to its agriculture, for the benefit of its manufactures—and in less than twenty years from the adoption of this policy—find its agriculture so oppressed, that these very manufacturers have to resort to foreigners for their daily bread. Thus showing the retributive justice of Heaven, who hath said: "thou shalt not muzzle the ox that treadeth out the corn." But, thanks to the wisdom or fickleness of our legislators, this state of things is rapidly changing; and it becomes us to inquire, now that the efficient or remote cause of the disease is about to be removed, how shall the patient be restored to his pristine health and vigor? Were this the case of a lovely form, whose freshness and beauty were fast fading away, without any evidence of fixed disease, the physician would say, "Restore her native air, and place her amongst the soft breezes of the valley, or the bracing air of those mountains, the scenes of her childish gambols; and we may hope to see the rosy-lipped cherub again bounding, like the antelope, from hill to hill."

Now, following this metaphor, may it not be well to inquire wherein has agriculture degenerated under its oppression, and to endeavor to restore that vigor, which was the cause and the consequence of its former health. Many of those who now guide the operations of the husbandman, have no personal recollection of the former state of things. But you and I, Mr. Editor, can now use the familiar phrase of some twenty years since. We were both reapers of the golden harvest, which seemed almost like coining money, immediately after the late war; and though schoolboys at the time, we recollect the high price so long kept up during Bonaparte's wars.

Your residence was on the sandy lands of the tide-water, where corn was the staple crop; but Providence cast my lot upon the green belt of the Blue Ridge, in a section, even then, rapidly improving in its agriculture. And I well remember, that the most usual sights in July and August, were large fields of clover subverted by the ploughshare, and the carts and wains all busily engaged in spreading the fertilizing produce of the stable and farm-pen, over those portions of the field which were more scantily covered with clover; and even those farmers who had not advanced to clover, were still anxious to reap the benefits of manuring and fallowing. And, as hope is more exciting than enjoyment, many hurried into those operations without even securing the previous crop, thinking less of the $2,000 they could get for it, than the $4,000 expected for the next year's produce; and I have often seen the coming crop covering those fallow fields with as bright a green as the clover which had so lately clad them, whilst the weather-beaten shocks stood amongst the rank stubble of the late harvest. But when our wise rulers took it into their heads that we must make every thing we wanted at home, and our hoodwinked farmers took up the idea, that to buy nothing was the best way to get rich, without reflecting that others must follow our example, they soon found that their barns were loaded with grain, laid up for many years; and, like the man in the parable, said "soul take thy rest." They then found that fallowing was a very laborious and expensive business; that the crop was very uncertain, and apt to be destroyed by the blue grass. For now they could not think of crossing their fallow, which was thought an expedient operation when wheat brought 9s. to 12s. a bushel; the crack of the whip, and shrill whistle of the driver, no longer impelled the patient ox with his fertilizing load; the weather was too hot in July and August; and the manure either wasted in the heap, or was all expended on tobacco, corn, or top-dressing.

The domestic market, which we sacrificed so much to gain, came at last; but it was not for wheat, but corn, which of course commanded the chief care and labor of the husbandman.

Now I would say to my brother farmers, resume those good old habits. This is the proper season. Select some field, or portion of one, of good land; not some worn-out gall, too poor for corn. Plough it well before the 1st September, if practicable, and re-plough it in that month, if necessary. Scatter all the manure you can raise, on the poorest part, and seed it well in the month of October; early, if in the upper part of the state, late in the month, if below. Plough or harrow in the wheat; but, at any rate, finish with a good smooth harrowing. If any part is inclined to be too wet, water-furrow it well. If your wheat has any smut, soak it

in a strong brine, and roll in quick-lime immediately before seeding; and then pray to Heaven for a good harvest. As to your corn land, sow only that which is good, and no more than you can prepare well, and in good time; put the balance in oats. No preparation is good, unless the wheat is put in regularly at a suitable depth, and the soil well pulverized. The wheat ought never to be sown without some previous work; the land may be ploughed up with two horses, and this is best on flat land which requires bedding. But on dry land, I think the best mode is to cut the stalks off with a hoe, (not a knife, which leaves them too high;) pile or remove them. Plough up the stubbles, by running a furrow with a one or two-horse plough. Harrow the land crosswise or diagonally. Sow the wheat, plough it in with small ploughs, and harrow again. This will make the land almost as fine as a plant-bed; and although it is more trouble, if the wheat turns out well, you will be paid; and if not, it would certainly have been worse with a worse preparation. As soon as the crop is seeded, begin to lay plans and make preparations for putting in your next crop in the same or a better manner; and if your crops fail, my word for it, "you may thank God that your neighbors' are no better."

RED LAND.

RETARDED ACTION OF GYPSUM.

To the Editor of the Farmers' Register.

Some time last year I communicated the fact, that the effect of plaster, applied to the young clover soon after it came up, was not perceptible. I concluded that the soil either did not need that manure, or that the plaster was not genuine. But I am gratified to state that that plaster, though apparently useless last year, has manifested its efficacy in the most striking manner this, in so much that the bed of twenty feet width through a large lot, which was left unplastered, looks, at a little distance, as if it had been mowed, while there is a tall and luxuriant growth of clover on both sides of it. I believe that experiments in plaster, and other things, often prove abortive for the want of the unremitted personal attention of farmers to the application of them, and to the not following them out by the nicest and most careful personal inspection and comparison.

A. C. MORTON.

Mecklenburg Co., July 18, 1838.

From the Southern Agriculturist.

ON PISE BUILDINGS.

To the distressed inhabitants of the city of Charleston.

Seeing from the act of the legislature, as well as from the ordinance of our city council, that in future we are restricted to the use of incombustible materials in erecting our buildings, and knowing as I do the high price of such, and the difficulty of getting them at so high a price, I would suggest the use of *pisé*, or rammed clay walls. This mode of building is of great antiquity, and brought to such perfection in the country about the beautiful city of Lyons, in France, as to appear like elegant palaces, some of which are known to have stood three hundred years. But to be concise on this subject: I have just erected the walls, and covered in a house of 48 feet long by 24 wide, containing six large rooms, and three wide passages; and though built under many difficulties, which I had to surmount as I went on, yet it will bear comparison with any brick house of the same size, and was built in nine months by two men only, (who hired out at $10 per month before employed on this work,) assisted by a black country carpenter for three weeks. From the experience I have gained in the erection of this house, I can with confidence recommend (if my directions are followed) the use of *pisé buildings;* viz.: The foundation must be stone or brick, raised twelve to eighteen inches above the ground. The mould, which is very simple, must be a piece of 3 by 4 scantling, laid across the foundation, with a mortice at each end, describing the width of your wall, allowing for the thickness of the boards that are to stand on their edges, with their sides to the studs of scantling, standing in the mortices of the transverse scantling already mentioned, and capped with a piece of the same width; these studs to be erected three or four feet apart. The flooring-boards intended for the house, and which require seasoning, will just answer for this purpose, and will not be the least injured from this use, but better seasoned. They must be reduced to one thickness, and cut with a mitre at one end to meet at the corners, clasped with tin or sheet iron clasps, secured with small screws. These may be taken off every other course, and used as before. In this mould so formed, lay six inches of clay, as dry as you can procure it, (I never found it too dry,) and commence ramming, with a rammer beveled from a square of six inches, to one inch, all on one side. The pisadore (who is the rammer) finding it will not yield more to this rammer, then commences with a square rammer, till it rebounds briskly from the wall; he then continues filling in, continuing the same process till the boards are full, and he lays another board on the edge of that just finished, and continues this process until the story is raised to receive the joists. These are laid on a piece of scantling, 3 by 4, laid along in the mould, and each end is well dove-tailed. This being effected, I would recommend that the mould be taken apart from the wall; it will be found an equal continued surface, resembling a piece cut out of a rock, of the color of the clay. If this has any blemishes (or inequalities of surface) from the clay sticking to the mould, they can be immediately remedied by a plaster made of the same clay, with a mixture of cotton or hair. This being done, lay on the whole wall a coat of linseed oil. It will immediately sink in, and form an indurator, that will convert the surface to a crust of putty, impervious to rain, or any kind of moisture. After you have given the wall a coat or two of the oil, you may paint it of any color you wish, which it will show and retain, with the greatest brilliancy. Then erect your mould on the next story, and continue as before, laying (which I forgot to mention) your door and window jambs plumb in their proper places in the mould, as you go along. This mould possesses many advantages over the one

which I described in my former article in the Agriculturist. It turns out the work in one continued mass, as if chiseled from a rock, and by this the work is reduced to three-fourths of the labor, and much more planished and perpendicular. In this manner, a pisé house can be built as elegant, durable, strong and incombustible, as of any other material allowed to be used. Its expense will depend much on the locality and vicinity of the clay, to the place it is erected. Having the clay at hand, my pisadore (or rammer) and one attendant, carried up sixteen inches of a wall, sixteen inches thick, in four days, all round a house, 48 feet long, and 24 feet wide. Now, if to build such a wall sixteen inches high, requires four days, how many days will it take to build it thirty-six feet high, the full height of a three-story house? Answer 108 days; which, at one dollar per day, would be equal to $216.

A brick house of this size would require 100,000 bricks, which at $15 per M., will amount to - -	$1500 00
Lime at 25 bushels per M., is 2500 bushels, at 20 cents, - - -	500 00
Laying the bricks at $4 per M., is -	400 00
Cost of the walls of the dwelling house only, - - - - -	$2400 00
Deduct the price of building the pisé house, - - - - - -	216 00
In favor of the pisé house, - -	$2184 00

But this is not all, for in a brick house you have to build a wood one within to make it fit to be inhabited; plaster and studs, laths, lime, nails and stucco, will amount to $1200, making the round sum of $3384. In opposition to this, I will state, the pisé walls require no plaster, but only to be smoothed and painted plain, or penciled, as taste may dictate. The pisé house being painted as it comes out of the mould, is fit to be inhabited as soon as finished.

But the difficulty of procuring clay is objected to. This will cease when we are informed, that all the bluffs about our harbor and rivers, contain it in abundance, and may be wafted over in lighters, and sold at a low price. Our harbor, and the rivers and creeks around us, contain inexhaustible banks of dead shells, which, if rammed in such a mould, will produce a fine wall equal to Tabby, well known to many of us. The banks of Ashley river abound in a concretion of calcareous matter fit for such buildings. To this important hint I call your attention. The doctrine that I have been endeavoring to inculcate, admits of the clearest demonstration, *actual experiment*. Take a box of a handy size, ram it with clay as described. When so filled and rammed, turn it up on a board, and lay it in the sun to dry, so as the box or mould may be lifted off without injury to the pisé-ed work. When dry, indurate it with linseed oil, and when it is dry, paint it on either side with any color you please. This experiment will satisfy you of the strength of the walls, the effects of the oil as an indurator, and the beautiful appearance of the paint.

I remain, with best wishes, yours, &c.

BARTH W. CARROLL.

From the Tennessee Farmer.

BEAVER OF NORTH AMERICA.

The natural habits of the beaver are topics so generally, though often so imperfectly handled, that we will rather speak at present of the manners which it is found to display in a domestic state, and of one or two other particulars less generally known.

We have domesticated certain animals, and most of those only to a certain extent, and are therefore apt to fancy that those are the only animals susceptible of domestication, and that they surpass all others in sagacity and companionable affections. But there is a very long list indeed, of animals, apparently the last to be thought of for domestication, but which, nevertheless, would please, and be pleased, if they, like others, lay in our bosoms, ate out of our dish, and sat at our firesides, and that would make manifest their understanding, and more than answer our caresses. An example presents itself in the beaver, whose habits in domesticity are pictured by a North American trader.

"I have kept several beavers," says Hearne, "till they became so domesticated as to answer to their name, and to follow those to whom they are accustomed, in the same manner as a dog would do, and they were as much pleased at being fondled as any animal I ever saw. In cold weather they were the constant companions of the Indian women and children, and were so fond of their company, that when the Indians were absent for any considerable time, the beavers discovered great signs of uneasiness; and, on their return, showed equal marks of pleasure, by fondling them, crawling into their laps, lying on their backs, sitting like a squirrel, and behaving like children who see their parents but seldom. In general, during the winter, they lived on the same food as the women did, and were remarkably fond of rice and plum-pudding: they would eat partridges and fresh venison very freely, but I never tried them with fish, though I have heard that they will at times prey on them. In fact, there are few grammivorous animals that may not be brought to be carnivorous."

Of the things *usually* eaten by the beaver, the same writer gives the following account:—"Their food consists of a large root, something resembling a cabbage stalk, which grows at the bottom of the lakes and rivers. They also eat the bark of trees, particularly those of the poplar, birch, and willow; but the ice preventing them from getting to the land in the winter, they have not any bark to feed on in that season, except that of such sticks as they cut down in summer, and throw into the water opposite the doors of their houses; and as they generally eat a great deal, the roots abovementioned constitute a principal part of their food during the winter. In summer they vary their diet, by eating different kinds of herbage, and such berries as grow near their haunts."

Beavers having returned in considerable numbers to Nottoway river and its tributaries, Mr. Ruffin, of the Farmers' Register, suggests the propriety of an experiment to domesticate them, with a view to the annual procurance of their rich furs, without destroying their lives. As this inoffensive and valuable animal is rapidly disappearing before the stratagems of the trapper, and the

march of civilisation, this resort may become necessary, if practicable, and might perhaps turn out to be a profitable enterprise.

ED. TENN. FARMER.

From the Columbia Telescope.

MANURES.

Mr. Johnston—In Ruffin's Farmers' Register for May, 1838, p. 111, is an extract from a letter by Lardner Vanuxem, esq., formerly my aid in the college here, giving a very brief account of the localities of what he terms *shell marl*, in South Carolina, viz.: at the Santee canal, Eutaw Springs, Dr. Jameson's, near Orangeburgh Court House, Mr. Darby's, in St. Mathew's, at Godfrey's ferry, on the Pedee river, on the Edisto, &c. To which I have to add, a locality two miles south of Darlington Court House. *Marle*, technically, is a soil composed of sand, clay, and limestone, where the latter earth is in the proportion of one-third or more. I have reason to believe that all the localities consist principally of limestone, with various proportions of sand, but very small quantity of clay, or argillaceous earth.

My son brought me, a short time ago, a specimen of the shells and soil from the great oyster bank on the Santee, which I believe extends eight or ten miles. I have also received from Judge D. Johnson, a specimen of the shell marl near Darlington Court House. I regard all these, from the character of the shells in them, to belong to the tertiary formation—in modern phraseology, antediluvian.

Of the specimen from Santee, I took 100 grains of an oyster shell, (of an extinct species.) I dissolved it in muriatic acid, and about 5 per cent. of sand remained undissolved. I threw down all the limestone with carbonate of potash, boiling the solution to drive away any excess of carbonic acid, which is apt to keep limestone in solution. The liquor being filtered, and the residuum dried and weighed, furnished the expected proportion of limestone.

I took the earth with which the inside of the shell was filled up. I dissolved it as before, procuring about 90 per cent. of limestone. The residuum was chiefly sand, with but little clay-earth.

I took 100 grains of the common gravelly soil furnished me by Judge D. Johnson, from Darlington Court House vicinity. I rejected all the larger fragments of shells, taking what appeared to be the soil. I treated it as before, with muriatic acid, which dissolved perfectly 75 per cent. of the gravelly soil, leaving (when dried perfectly and weighed) 25 per cent. of soil, almost entirely sand, undissolved.

Here, then, in various parts of our state, are deposits of shell limestone, just as valuable for manure as any other whatever, to sandy, to clayey, or to an intermixture of sandy and clayey soil. A source of wealth that is of very great extent and very great value.

Limestone in Europe is applied when burnt into lime, sometimes to the amount of 300 bushels per acre. Twenty hundred weight of limestone ought to be exposed to fire in the kiln, till it will yield but eleven hundred weight, or more accurately from 43 to 44 per cent. of carbonic acid ought to be driven off by the heat; else the lime is imperfectly burnt, and will not make good mortar. When laid and slacked upon the land, it regains from the air about 30 per cent. of carbonic acid in about 10 days, and is gradually changed into limestone again. Hence the necessity of keeping lime from the air, which is to be used as a cement; hence, too, powdered limestone may be as good as lime in most cases. I would, therefore, were I a farmer, merely grind and screen the shell marl, without burning it, and put at least 300 or 350 bushels of the screened earth per acre, on the land. This will form a good constitution of soil, and will permanently prove useful. I should deem 400 bushels per acre, on sandy soils, not too much, and the addition of clay will add to the productive power of the mixture thus made. But as I am not a practical farmer, I say this with deference to the judgment of those who are.

I am, &c.

THOMAS COOPER, M. D.

From the Farmers' Cabinet.

CAPONS.

Auburn, Frederick Co., Md. Nov. 23, 1837.

I very much fear you will begin to think me either an epicure or the son of an epicure, it being only a short time since that I served you up a mess of bacon, and now I come with a dish of fowl. It has been said, it is not good for man to be alone. Bacon, although good alone, is very much better when accompanied with a good, round, fat pullet. But it is not a pullet that I am about to serve up to you at present, but her brother, though in an altered from, as you will learn in the sequel. It is a fact known to every traveller, that there is no dish presented before him half so often as that of chicken, served up in every form of which it is capable, broiled, fried, stewed, baked, or boiled; and it is a fact equally well known, that there is no dish so often turned away untasted, in consequence of its disgusting appearance of bad culinary preparations. I allude of course to such as we too frequently meet with on our public tables and watering places, (Bedford itself not excepted.) How often are the ears of the hungry and weary traveller assailed the moment the stage draws up to the inn, by the dying shrieks of the rooster that had but the moment before been picking up a scanty subsistence from the dunghill, and in a few moments more graces the head of the table, looking more like that well known waterfowl, vulgarly called a fly-up-the-creek, which is indebted alone to the length of its legs and neck for a subsistence, than what it really is. But I have promised to give you something even better than a fat pullet, and I shall now proceed to serve it up; I mean then that favorite dish of the ancient Romans, the "gallas spads or capon," or more plainly, the cock altered by castration, and in such high repute was it, that it generally graced the board of that most excellent judge of good eating, Lucullus, and if Shakspeare is to be believed, it was a tit-bit not only with Jack Falstaff, but with the Justice who is represented—"In fair round body with good capon lined." In England, at the present

day, at every respectable eating-house, the first thing that greets the eye of the traveller and heads the bill of fare, is a capon, either boiled or baked. In France they are made doubly useful, not only as an article of food, but a means of production; if I may be allowed the expression, they are used as a foster-mother for raising chickens, which they do much better than the hen, owing to the large size and thick coat of feathers. The poulterers use a considerable number of them for this purpose,—the moment the hen has hatched her brood they are given to the capon, which rears them with all the care of the mother, the hen is cooped and fed until she gains her flesh and strength, and then turned out to lay and set again; in this way the poulterer is enabled to raise a large number of chickens from half the number of hens. The capon at market sells higher than any of our domestic fowls. What is the reason then in our country, where good living is so highly prized, the capon is seldom or never seen? Should you travel from Maine to New Orleans, you will probably never have this question put to you at table, "Sir, shall I help you to a fine piece of capon." I would by no means attribute this neglect of one of the finest dishes in the world to obtuseness of palate, but rather to a want of the necessary information as to the manner of performing the operation on the cock. To obviate this, I will subjoin directions, by the observance of which a man of common adroitness can make two dozen capons in an hour. Lay the chicken before you on his left side, with his head towards your right hand. Let an assistant hold him by his head and legs extended; with a sharp knife make a transverse incision of one and a half inch or more in the side just below the ribs. Insert the fore finger, and near the middle of the body, at the distance of about three quarters of an inch from the incision, near the spine will be found the testicles, which may very easily be removed by the thumb and finger; sew up the orifice and daub a little tar over it to keep off the flies. Care should be taken in cutting through the several integuments lest the viscera be wounded. The cock should be about half grown. Not one in a hundred will die if the operation be properly performed. After a fair trial both of the bacon and capon, should you relish them, I may be induced at some future time to serve you up some other dish, which I only hope may be found as agreeable to your numerous readers as was the long and learned dissertation we had some time since upon Hollow Horns. With my best wishes,

I am respectfully your ob't. serv't.

J. W. J.

From the Genesee Farmer.

DUCKS.

It is stated in a New-York newspaper, "that several of the farmers on Long Island, who raise large numbers of ducks, have had nearly their entire flocks of young ones destroyed, by a red insect named the 'Lady bug:' a *post mortem* examination led to the discovery, as, on opening the body, the bugs still living were taken out by the handful." So far as our observation has gone, insects of all kinds, with perhaps a single exception, have flourished abundantly the present season, the high temperature of June having proved as propitious to their increase as to the rapid growth of vegetation. The exception to which we have alluded, is the common striped bug, so fatal to cucumbers and squashes, of which we have not seen a single one the present season.

CONSIDERATIONS UPON THE NATURE OF THE VEGETABLES THAT HAVE COVERED THE SURFACE OF THE EARTH, AT DIFFERENT EPOCHS OF ITS FORMATION; READ BEFORE THE ACADEMY OF SCIENCES OF PARIS, ON THE 11TH SEPTEMBER, 1839, BY MONS. ADOLPHE BRONGNIART.

Translated from the French, and communicated for the Journal of Science and Arts, by R. W. Haskins,* of Buffalo, New York.

Curiosity is one of the most distinctive faculties of the human mind; one of those that most clearly mark the distance between man and the brute creation; and for this reason it may designated one of his most noble faculties, whenever directed to any end really worthy of his being.

It is this which continually excites us to extend the field of our knowledge, and to fathom the most hidden mysteries of nature, without being able to hope, for the most part, any other reward than the good which will result to all intelligent beings, in proportion as they are able to form ideas more exact upon the nature of the phenomena which surrounded them. These phenomena appear the more difficult of investigation in proportion as, by their nature and position, they are farther removed from our direct observation; and in like manner we are struck with the results to which profound researches have conducted those men who have made these investigations the object of their studies.

The invention of the telescope, by opening to our view what is passing in the elongated regions of space; and of the microscope, by revealing to us the existence of numberless beings so minute as, but for this instrument, would for ever have escaped our observation, have made, upon the human imagination, the most vivid impression.

The sciences have made such rapid advances, within late years, that no one can reasonably expect to open new views and to disclose new truths equally exciting to human curiosity as those disclosed by the telescope and the microscope; but still, the study of the soil upon which we daily tread, has become, within the last half-century, in the hands of Werner, of Cuvier, and the crowd of learned and able men who have assiduously followed these illustrious pioneers, one of the sciences the most fruitful in results, not only of high interest to the professionally learned, but well calculated vividly to interest the imagination of all persons who love to reflect upon the great phenomena of nature.

In investigating the layers which compose the superficial strata of the earth, their order of super-position, their nature, and the animal and vegetable remains which they contain, geology traces for us the history of the earth, during the long periods of time that have preceded its pre-

*Mr. Haskins prefers an orthography in some cases peculiar, and retains also certain French idioms.—Eds.

sent condition; it makes known to us the beings which have successively inhabited its surface, the revolutions that have conduced to their destruction, and those which have given birth to the mineral layers the earth contains, and the modifications to which this surface itself has been subject by reason of these revolutions; it discloses to us, in short, that all these phenomena, which have necessarily required so many centuries for their accomplishment, were prior, in point of time, to the creation of man. It conducts us alike to appreciate events, and to re-construct beings which have preceded, many thousand years, not only the most ancient historical traditions, but also the very existence of our race.

This prolonged history of the formation of the superficial strata of the earth, is constituted, like the history of nations, of periods of repose, or of tranquillity sufficiently great, at least, for the waters and the dry land of the surface to become peopled by a variety of inhabitants; and of periods of revolution, during which resistless forces have agitated this surface, elevating mountains, submerging lands previously dry, and causing ancient beds of oceans to issue from the bosom of the deep; in short, pouring over pre-existing rocks the materials for new layers which, enveloping the ruins of living beings, destroyed by these violent convulsions, have thus preserved their remains as precious monuments which now reveal to us, after so many thousand years, the nature of the ancient inhabitants of our globe, and the order in which the several races of beings have succeeded each other.

The study of the periods of these revolutions, and of those of repose, are alike of the most vivid interest: but the first are entirely the province of the geologist; while the second, on the contrary, necessarily require the light of the zoologist or the botanist; for these alone are able, by an exact comparison of the fossil remains of former beings with the corresponding parts of such as are now existent, to determine the relations which exist between the inhabitants of the globe, at various and distant epochs. It was thus Cuvier, in his admirable researches upon fossil bones, basing his investigations upon the positive data which comparative anatomy furnishes, was enabled to reconstruct the skeletons of the greater part of the animals of which the remains had then been discovered, and also to determine, with the greatest probability, their exterior forms, and their analogy to those animals with which we are now acquainted.

Botany, nothwithstanding it has long furnished fewer documents upon the ancient state of the globe, ought, nevertheless, to be equally laid under contribution, by the geologist; and it is even able to cast more light than zoology upon the state of the terrestrial surface, during the most ancient periods of its formation. Indeed, at that epoch when life first began to be manifested upon our globe, the animals were all confined to the interior of the waters, and even these presented but diminished specimens of their kinds; while a powerful vegetation, forming vast forests, covered at that early period, all such parts of the earth as were not submerged by the sea; and each succeeding period of repose has had its own peculiar vegetation, more or less varied, and in greater or less abundance, according to the circumstances which influence the development of the beings that composed it, and perhaps, also, in proportion to the duration of these periods; but almost always entirely different from those of either the preceding or succeeding epochs.

Of the different associations of vegetables which have successively inhabited our globe, there are none which so pointedly merit our attention as those which seem to have been first developed upon its surface; which appear during a long space of time to have covered with dense forests all those parts of the earth that rose above the general level of the waters, and of which the remains of successive growths, heaped one upon another, have formed our layers of coal, so deep, extensive and numerous; and in this form the remains of these primeval forests, which have preceded, by so many centuries, the existence of man, and which now supply us with fuel, in place of our more modern forests, of which the great increase of the human family is causing a rapidly augmented destruction, have become one of the principal sources of the prosperity of nations.

None can doubt that coal owes its origin to accumulated masses of vegetables, changed and modified, as probably the layers of peat in our marshes would be, if they had been overlaid by thick coverings of mineral substances, compressed under the weight of these, and subsequently exposed to an elevated temperature. If farther confirmation of this origin were necessary, it is found in the almost ligneous structure which coal sometimes presents, and in the numerous remains of plants contained in the rocks which accompany it.*

But the study of the impressions of stems, leaves, and even fruit, which are in general contained, in so great quantities, in these rocks, proves not only the vegetable origin of this substance, but even enables us to determine the nature of the vegetables of which it has been formed, and which, consequently, at the period of such formation, occupied the surface of the earth.

Among these vegetable imprints, the most frequent are those produced by the leaves of the ferns; yet these ferns of the primitive world are not those which now grow in our climates; for Europe, at this time, does not produce more than from thirty to forty species, while the same regions then nourished more than two hundred, all much more analogous to those now found between the tropicks than to those of the temperate climates.

In addition to the leaves of ferns, the same earths contain trunks, the dimensions of which render them comparable to the most gigantic trees of our forests, while their form is wholly dissimilar; and indeed all the ancient naturalists, struck with this dissimilarity, and yet desiring to find analogous productions still existent, referred them to arborescent vegetables, then imperfectly known, as the bamboos, palms, and the great cactus, sometimes designated *torch-thistle*. But a more

* The most complete and valuable collection of plates of impressions of these coal plants which is generally accessible, in this country, will be found in this Journal, vol. xxix, No. 2. This volume contains Dr. Hildreth's valuable paper upon the coal deposits of the valley of the Ohio, which he has accompanied with some thirty pages of excellent drawings of fossil remains and impressions, mostly vegetable, found in the accompanying rocks.—*Translator.*

attentive comparison of these products of the equinoctial regions with those trunks, the growth of the ancient world, suffices to dissipate all relations, which are founded only on some resemblances in the general aspect, that have been attempted to be established between them; and a more profound examination, either of these trunks or of the leaves which accompany them, readily shows that the vegetables which formed these primitive forests are not identical with any trees still found flourishing upon the earth.

The arborescent ferns which, by the elegance and magnitude of their exterior, now form one of the principal ornaments of the equatorial regions, are the only arborescent vegetables which are recognized, even in small number, among the trees of this antique vegetation.

As to the other fossil stems, remains of these primitive forests of the ancient world, it is among the most humble vegetables of our epoch that we must seek their analogues.

For instance, the calamites, which attained from four to five mètres (a little more than 13 to 16 feet) of height, and from one to two décimètres (not quite four to eight inches) of diameter, have almost a complete resemblance, in all the points of their organization, with the equiseta (horse-tails) which grow so abundantly in the marshy situations of our climates, and of which the stems, hardly as large as the finger, rarely surpass one mètre (about 39⅓ inches) in height. The calamites, then, were arborescent equiseta, a form under which these plants have wholly disappeared from the surface of the earth.

The lepidodendrons, of which the numerous species appear to have mainly constituted the forests of this ancient epoch, and which have probably contributed more than all other vegetables to the formation of coal, differ very little from our lycopodiæ. We recognize in their trunks essentially the same structure, the same mode of ramification; and in short we see inserted upon their branches leaves and fruits analogous to those of these vegetables. But, while the lycopodiæ of the present day are small plants, most frequently creeping, and similar to the great mosses, attaining very rarely one mètre (about 39⅓ inches) in height, and covered with very diminutive leaves, the lepidodendrons, preserving the same form and aspect, elevated themselves to twenty or twenty-five mètres (a little more than 65 to 82 feet,) having, at their base, near one mètre (about 39⅓ inches) of diameter, with leaves which sometimes attained to half a mètre (over 19½ inches) in length. These were, consequently, arborescent lycopodiæ, comparable, by their stature, to the largest firs, of which they enjoyed the rank, in this primitive world; forming, as these now do, immense forests, in the shade of which were developed the ferns, so numerous at that period.

How different this powerful vegetation from that which now clothes, in ever-varying tints, the surface of the earth! Magnitude, strength, and activity of growth, constituted its essential characteristicks; the smallest plants of our epoch were then represented by gigantick forms; and yet, what simplicity of organization, and what uniformity in the midst of a vegetation so enormous!

At the present day, even in those regions where nature has suffered no change at the hand of man, the eye reposes with delight upon trees which are immediately distinguishable by the diversity of their form, and the tints of their foliage; and which often support flowers or fruits of the most dissimilar colors. This variety of aspect is still more strongly illustrated by a contemplation of the diversified shrubs and plants which fringe the borders of our forests, or adorn our meadows, and of which the flowers exhibit to us almost all the tints of the prism. Finally, there result from this diversity of structure, among these plants, many varieties suited to the nourishment of man or of animals; and indeed such as are even indispensable to their existence.

The variety in the organization and aspect of the vegetables which at present cover our globe is indicated by the number of natural groups into which they are capable of being divided. These groups or natural families amount to more than two hundred and fifty, of which about two hundred belong to the class of the dicotyledons, (which consequently present the greatest variety of structure,) and thirty to that of the monocotyledons. Now the first of these classes, that is, the two hundred families which they contain, are completely wanting in our primitive flora, and seldom can we there recognise any indications of the monocotyledons.

The class which constituted, almost alone, the vegetation of this primitive world is that of the vascular cryptogamia, which at present comprehends no more than five families; almost all of which had parallels in the ancient world; such are the ferns, equiseta and lycopodiæ. These families constitute, thus to speak, the first degree of ligneous vegetation: they present, like the arborescent dicotyledons or monocotyledons, trunks more or less developed, of a solid texture, although more simple than those of these trees, and garnished with numerous leaves; but they are deprived of those reproducing organs which constitute the flowers, and they present, in place of fruit, organs much less complicated.

These plants, so simple, so little varied in their organization, and which, by their number and dimensions, rise not above a very inferior rank, in our present vegetation, constituted, in the dawn of the creation of organized beings, almost the entire vegetable kingdom, and formed forests so immense that we find not their analogy in modern times. The rigidity of the leaves of these vegetables, the absence of fleshy fruits and farinaceous seeds, would have rendered them very unfit to have served as aliment to animals: but terrestrial animals, at the time of their growth, had not yet existence; the seas alone offered numerous inhabitants; and the vegetable kingdom, at that period, maintained undivided sway over all the undeluged portions of the earth; upon which it seems to have been called to play another part, in the economy of nature.

We cannot doubt, in truth, that the immense mass of carbon accumulated in the bosom of the earth, in a state of coal, and which is the product of the destruction of those vegetables which grew at that ancient epoch, upon the surface of the globe, has been imbibed, by those vegetables, in the carbonic acid of the atmosphere—the only form under which carbon, not derived from the destruction of preëxisting, organized beings, can be absorbed by plants.

Now, a proportion, even very feeble, of carbonic acid, in the atmosphere, is generally an obstacle to the existence of animals, and particularly of the most perfect classes of them, as mammifers, and birds; while, on the contrary, this proportion is highly favorable to the growth of vegetables: and if we admit that there existed a proportion very much greater of this gas in the primitive atmosphere of our globe than the present atmosphere is found to contain, we may consider this one of the principal causes of the powerful vegetation of these ancient epochs.

This collection of vegetables, so simple, so uniform, and which would consequently have been so little fitted to furnish suitable aliment for animals of diversified structure, such as those existing at the present day, in purifying the atmosphere of the carbonic acid which it then contained in excess, would have prepared the conditions necessary to a creation more varied: and if we still wish to indulge that sentiment of pride which has caused man to assume that all in nature has been created exclusively for him, we may suppose this primitive, vegetable creation, which preceded, by so many centuries, the appearance of man upon the earth, was, in the economy of nature, designed to prepare the atmospheric conditions necessary to his existence, and at the same time to accumulate those immense masses of combustibles which his industry was in future time to apply to his necessities.

But, independently of this difference in the nature of the atmosphere, which the formation of these vast depots of fossil carbon renders extremely probable, may not the nature of the vegetables themselves, that have produced them, furnish some data upon the other physical conditions to which the surface of the earth was subjected during this period? The operations of nature now going on in different regions of the globe, may throw some light upon this question.

The study of the geographical distribution of those plants appertaining to the same families which alone composed the vegetation of the coal period, may, indeed, indicate to us the climacterick conditions and consequently the physical causes which favored the increase of stature as well as the great frequency of these vegetables; and we may conclude from these, with much probability, that the same causes determined their preponderance at that epoch.

We see for example, that the ferns, equiseta, and lycopodiæ attain a more lofty stature in proportion as their geographical position approaches the equator. Thus it is only in the hottest regions of the globe, that we find those arborescent ferns which combine with the towering and majestick mien of the palms, the elegant foliage of the ordinary ferns, and of which we have indicated the existence in the coal formations. In these same regions the equiseta and lycopodiæ attain to a stature double or triple that which the largest of these species present in temperate climates. A second condition appears to have a still more marked influence upon their preponderance, in reference to the vegetables of other families, namely, humidity and uniformity of climate; conditions which are united in the highest perfection, in the small islands situated far distant from continents.

In such islands, indeed, the extent of the surrounding oceans fixes a temperature with but slight variations, and coupled with perpetual humidity; circumstances which appear to favor, in a remarkable manner, the development and the variety of specifick forms among the ferns and the analogous plants; while, on the contrary, under the influence of the same conditions, the phenogamous plants are little varied, and are far less numerous. From these causes it results, that while on the extensive continents of the earth the vascular cryptogamick plants, such as the ferns, lycopodiæ, equiseta, &c. often form scarcely one-fiftieth of the total number of vegetables, yet in the small islands of the equatorial regions, these same plants constitute almost half, and in some cases, even two-thirds of all the vegetables which inhabit them.

The archipelagos, situated between the tropicks, such as the islands of the great Pacifick ocean, or the Antilles, are, then, the points of the globe which at the present time present vegetation the most analogous to that which existed upon the earth when the vegetable kingdom commenced, for the first time, to develop itself thereon.

Detailed examination of the vegetables which accompany the coal cannot fail, therefore, to induce the inference that at this remote epoch the surface of the earth, in the countries where are found those vast depots of fossil carbon with which we are most familiar, namely, in Europe and North America, offered the same climacterick conditions which now exist in the archipelagos of the equinoctial regions; and probably a geographical configuration little different.

When we consider the number and thickness of the layers which constitute most of the coal formations, and examine the changes that, from first to last, have taken place in the specifick forms of those vegetables of which they have been constituted, we cannot fail to see that this stupendous primitive vegetation, during a long interval, must have covered with its dense forests all parts of the globe which were at that period elevated above the sea; for all these present themselves with the same characteristicks in Europe and America; and equinoctial Asia, as well as New Holland, seem therefore to have participated, in this general uniformity of the structure of vegetables.

Nevertheless, this primitive vegetable existence promptly disappeared, to give place to a new creation, composed of beings of an organization less extraordinary than the preceding, but almost equally different from such as flourish at the present day.

To what cause can we attribute the destruction of all the plants which characterize this remarkable vegetation.

Is it due to some violent revolution of the globe? Did it arise from the gradual change of the physical conditions necessary to their existence; a change in part arising from the presence of these vegetables themselves? These questions cannot be resolved in the present state of our knowledge upon the subject.

Certain it is, however, that the deposition of the last layers of the coal formation was followed by the destruction of all the species which constituted this primitive vegetation, and particularly of those gigantic trees of peculiar structure, as the lycopodiaceæ, the ferns and the equiseta of gi-

gantick growth; which was an essential characteristick of this primitive creation.*

After the destruction of this primitive vegetation, the vegetable kingdom appears for a long period not to have attained the same degree of development. Indeed, in the numerous layers of secondary earths which succeed the coal formations we scarcely ever find those masses of vegetable imprints, a species of natural herbariums, which, in these ancient depots of carbon, attest to us the simultaneous existence of a prodigious number of plants. Scarcely in any part of these formations do we meet with thick layers of fossil combustibles; and never are such layers often repeated, or found of such great extent as in the coal deposits. Either the vegetable kingdom at this period occupied more circumscribed portions of the surface of the earth, or its scattered individuals covered but incompletely a soil of little fertility, and of which the revolutions of the globe had not permitted them to become tranquil possessors; or, finally, the condition of the surface of the earth was not favorable to the preservation of the vegetables which then inhabited it.

Yet that long period which separated the coal from the tertiary formations, a period that was the theatre of so many physical revolutions of the globe, and which witnessed the appearance, in the waters of the deep, of gigantic reptiles, types of the fantastical organizations in which we may suppose we often recognize those monsters born of the imaginations of the poets of antiquity; this period, I say, is remarkable in the history of the vegetable kingdom, by the preponderance of two families which are lost, so to speak, in the midst of the immense variety of vegetables with which the surface of the earth is covered, at the present day, but which then predominated over all the others, by their number and their magnitude. These are the *coniferæ*, of which the fir, pine, yew and cypress furnish well known examples; and the *cycadeæ*, vegetables wholly exotick, less numerous at the present day, than at this ancient period, and which joined to the leaves and mien of the palms, the essential structure of the coniferæ. The existence of these two families, during this period, is of high importance as signalizing an intimate relation between them, by their organization; and they form the intermediate link between the vascular cryptogamia, which composed, almost alone, the primitive vegetation of the coal period, and the phanerogamick dicotyledons, strictly speaking, which constituted a majority of the vegetable kingdom, during the tertiary period.

Thus, to the vascular cryptogamia, the first degree of ligneous vegetation, succeeded the coniferæ and the cycadeæ, which held a rank more elevated in the vegetable scale; and to these last succeeded the dicotyledonous plants, which occupy the summit of that scale.

In the vegetable kingdom, as in the animal, there has been, then, a gradual improvement in the organization of the beings which have successively existed upon our earth, from the first which appeared upon its surface even to those that inhabit it at the present day.

The tertiary period, during which were deposited those earths that now form the soil of the principal capitals of Europe, as London, Paris, and Vienna, witnessed transformations, in the organick world, greater than any of those which had taken place since the destruction of the primitive vegetation.

In the animal kingdom: the creation of mammifers,* a class which all naturalists concur in placing at the summit of the animal scale, and by which nature seems to have preluded the creation of man; in the vegetable kingdom, the creation of the dicotyledons, a grand division which, by unanimous consent, botanists have always placed at the head of this kingdom, and which, by the variety of its forms and organization, by the magnitude of its leaves and the beauty of its flowers and its fruits, must, of necessity, have imprinted upon vegetation, an aspect very different from that which it had offered through all previous periods.

This class of dicotyledons, of which we are scarcely able to cite any indications at the close of the secondary, presented itself, all at once, during the tertiary period, with preponderating influence. It then, as at the present day, held dominion over other classes of the vegetable kingdom, both in reference to the number and variety of the species, as well as the magnitude of the individuals. Thus the assemblage of vegetables which inhabited our climes during the deposition of the tertiary formation, which enveloped their ruins in its sedimentary layers, were intimately allied to the mass of our present vegetation, and more particularly to the flora of the temperate regions of Europe and America. The soil of these countries was covered then, as at present, with pines, firs, culms, poplars, birches, elms, walnuts, maples, and other trees almost identical with those which still flourish in our climates.

And yet, not only do we not recognize any indications of those singular vegetables which characterized the primitive forests of the coal period, but we rarely encounter, there, even fragments of plants analogous to those which now vegetate between the tropicks.

We do not, however, necessarily infer that the same vegetable forms have been perpetuated from this epoch, still very ancient, (since it preceded the existence of man,) to the present day. No: very sensible differences almost always distinguish these inhabitants of our globe, very recent, geologically, but exceedingly ancient, chronologically, from our cotemporaneous vegetables to which they seem most nearly allied; and the existence in these same earths, in the north of France, of palms, very different from those which still vegetate upon the borders of the Mediterranean, and of a small

* We find, it is true, in some parts of the secondary formations, a small number of arborescent ferns and of the gigantick equiseta; but yet of a stature much less considerable than those of the coal formations; nor do we discover, there, any trace of the arborescent lycopodiaceæ analogous to the lepidodendrons.—*Author's note.*

* In placing the first appearance of mammifers at the epoch of the tertiary formation, I do not include the fact, unequalled elsewhere, of the fossil mammifers of Stonesfield; a case which forms an exception to all former experience, and which cannot be detailed in so limited an essay.—*Author's note.*

For drawings and brief descriptions of these fossils, which occurred in *oolite*, see Lyell's Geology, American edition, Vol. I, pp. 154-5.—*Translator.*

number of other plants which appertain to families now limited to the more torrid regions, seem to indicate that at this epoch central Europe enjoyed a temperature more elevated than at present; which, besides, accords very well with what we may deduce from the presence, in the same formations, and the same countries, of elephants, rhinoceroses and hippopotami, animals which are now rarely found to range beyond the tropicks.

What an astonishing contrast between the aspect of nature during modern geological periods, and that which she offered when the primitive vegetation covered the surface of the globe!

Indeed, at the periods in question of the geological history of the world, the earth had already assumed, in great part, at least, the form which it presents at the present day; continents very extended, and mountains greatly elevated, fixed and determined varied climates, and thus favored diversity of beings. In this way, in countries of little extent, the vegetable kingdom offered us plants equally as diversified, one from another, as those found growing at the present day.

To the coniferæ, with their narrow durable leaves of sombre green, were joined birches, poplars, walnuts, and maples, with broad leaves of a more lively tint; and in the shade of these trees, on the borders of waters or upon their surface flourished herbaceous plants analogous to those which at present embellish our fields by the diversity of their forms and colours, and the variety of which renders them suitable to satisfy the different tastes of an infinity of animals, of all classes.

The forests of the ancient world, like those of our epoch, served, indeed, as a refuge for a vast number of animals, more or less analogous to those which still inhabit our globe. Thus elephants, rhinoceroses, wild boars, bears, lions and stags, of all forms and of all statures, have successively inhabited them; while birds, reptiles, and numerous insects, complete this map of nature, as she presented herself, upon such parts of the earth as were elevated above the level of the oceans; the whole forming a scene equally beautiful and equally varied as that which is still witnessed upon the emerged portions of our globe.

On the contrary, at the dawn of the creation of organized beings, the terrestrial surface, divided, without doubt, into an infinity of islands, low, and with a climate almost uniform, was, it is true, covered with immense vegetables; but these trees, differing little from each other in their aspect, and the tint of their foliage; deprived of flowers and those fruits with brilliant colors which so highly adorn many of our large trees, must have imprinted, upon that vegetation, a monotony not interrupted even by those small herbaceous plants that, by the elegance of their flowers, constitute the ornament of our groves.

Add to this, that neither mammifer, or bird, nor any animal, in short, was present to enliven these dense forests, and we may be able to form a very just idea of this primitive nature; sombre, cheerless and silent, but at the same time so imposing by its grandeur, and by the space which it has been called to fill in the history of the globe.

Such, gentlemen, is a rude outline of the great revolutions of terrestrial vegetation, as the researches made upon this subject, within the last thirty years, have enabled us to trace them. Each day will doubtless add new traits to these details; but recent discoveries, by confirming the results at which we had previously arrived, seem to assure us that this general delineation will not experience great changes when, thanks to the materials that are being collected on all sides for this object, we shall be enabled to transform this rough draught into a picture more finished and complete.

SIXTH ANNUAL REPORT OF THE PRESIDENT AND DIRECTORS OF THE PORTSMOUTH AND ROANOKE RAILROAD.

In submitting to the stockholders of the Portsmouth and Roanoke railroad a report of the progress, business and prospects of the company during the past year, respectfully represent:

That the subscription of $50,000, authorized by law and accepted by your last general meeting, was made and the money paid by the board of public works, in August last, which sum, it was believed, would enable this board, besides satisfying all pressing demands, to have completed the warehouse and wharf which had been commenced in Portsmouth; this would have been effected, but for the melancholy accident which happened about this period. A train carrying a number of persons residing along the line of the road, who had for recreation merely visited the towns, on their return were met by a train bringing a load of lumber, a short distance beyond Suffolk, at the only point on the road where a meeting would have been considered dangerous. As both were descending, and not perceived by either until too late to arrest their progress, a collision ensued most disastrous in its consequences. Demands for payment increased: these and the expense in replacing the coaches destroyed, absorbed all our funds, and for some time the revenue was insufficient to meet the current expenses. When business revived, and the Weldon bridge was nearly prepared for use, two additional engines were procured, which unfortunately proved too heavy for our road, a portion of which was discovered to be decaying. Another accident not less fatal in its consequences than the former, occurred a few days after we had succeeded in crossing the Roanoke, when our prospects seemed most promising. This was occasioned by the elevation of the end of an iron rail perceived too late to be prevented. By DOUBLING it threw the engine off the track, which suddenly checking the progress of the train, caused a dreadful crush of all the coaches which were next the engine. Until that fatal event, this position was believed the least liable to injury, in case of accident, as cars in the rear had several times run off, without injury to the coaches in front of them. The practice of placing the coaches in rear of the burthen cars has from that day been adopted by us, and, we are informed, other roads have made the same change after hearing of our misfortune.

This second dreadful calamity, added to the state of dilapidation in which that portion of the road between Portsmouth and Suffolk was found to be, threatened a total suspension of all the business of the road. But by increased exertion such repairs have been effected, and by improvements in the condition and management of the engines, and regularity in the running, confidence

seems in a great measure restored, and the travel has so much increased as to justify the opinion heretofore expressed that few roads in our country have a better prospect of ultimate success.

Among the errors into which we have fallen, it is believed that the effort to establish and carry on an extensive manufacture of machinery has proved the most expensive, though in the infancy of our establishment the difficulty and delay met with in promptly procuring necessary articles or repairs seemed to render such an establishment indispensable. Now when the number of such factories has greatly increased, conducted by workmen for their own account, it is believed that a small part of the force, heretofore deemed necessary, will be required, consequently reducing greatly these expenditures. Considerable loss has also been sustained by being compelled, in consequence of a mail contract and the delay in finishing Weldon bridge, to purchase stages and horses, which we had contracted to have furnished up to the period when it was supposed they would be no longer required. That period having arrived, being unable to renew or extend our contract, and the bridge still unfinished, the purchase was indispensable.

Application was made to our late legislature for a loan, on a pledge of the stock and profits of the company. The terms on which it has been authorized, require the consent of the stockholders; the law is submitted for your consideration. It may be proper to remark that a reliance on that aid has enabled us to procure a credit, without which it would have been impossible to have continued the operations of the road.

By agreement with the Wilmington company we are permitted to use their road to Halifax, and when finished (which it is expected will be about the first of July next,) to continue our run to Enfield, about ten miles farther south, by which their stage route will be much shortened. Mutual interest will secure the continuance of that good feeling, which has ever prevailed between these companies.

An agreement has also been entered into with the Maryland and Virginia steamboat company, which, while it affords increased expedition and comfort to travellers, cannot fail greatly to advance the interest of both companies.

With the aid relied on from the state, the company will be relieved from existing debts, be enabled to finish the wharf and warehouse so much needed for the accommodation of the business of the road, and to procure necessary engines and coaches, and then by means of the connexions already secured, we feel fully justified in our expression of confidence in the value of this enterprise.

The reports of the treasurer and general agent are herewith submitted.

By order of the board.

ARTHUR EMMERSON, President.

Office of the Portsmouth and Roanoke Railroad Company.

To the President and Directors of the Portsmouth and Roanoke Railroad Company:

Gentlemen:—Although from personal observation you may be presumed to be acquainted with the condition of the work under your control which has been committed to my management, it may be considered my duty according to usage to review the operations upon the road since the affairs of the company were confided to me.

By reference to the 5th annual report of the president and directors, it will be seen that the road was opened to Garysburg in August, 1836. The tardy progress of the remainder of the work, comprising the superintendence from Garysburg, to the Roanoke river, the bridge across the Roanoke, and the road and fixtures at Weldon, rendering my personal attention only occasionally necessary, I voluntarily relinquished one half of my annual salary in October, 1836, still however retaining entire charge of the transportation until May, 1837, when, agreeably to some general regulations of the stockholders, the duties of general agent of transportation devolved on the president of the company, and I confined myself entirely to the completion of the road, which was effected in November, that is, on the 27th of November last, the bridge over the Roanoke was so far completed as to allow the passage of the cars, which commenced on that day running regularly to Weldon.

On the 1st January, 1838, I again resumed the charge of the transportation department by a resolution of the board appointing me the "general agent and superintendent of the affairs of the company." I found the road very much injured by the use of two heavy engines which had been most ill-advisably placed upon it. Between Portsmouth and Suffolk, where the rails had undergone some decay, the road was entirely broken down, and almost impassable. Between Suffolk and Weldon, although much of the iron was broken and many of the rails crushed, this portion of the road was not so materially injured. My attention was immediately directed to the repairs of the road, and a large force was employed, which soon put it in a condition that has, I believe, given general satisfaction to the public and to all concerned. The engines were also put in repair; and without going into details, let it suffice to say, that, since the 10th of January, the cars have been running with a regularity and speed unsurpassed by any other road in the country. And, as I observed in my report to the board in May last, nothing is now wanting but an administration of the affairs of the company upon the system which has been adopted. The simplicity of a railroad with its embankments, excavation, bridges, and iron-capped superstructure, and the great ease with which high velocities are attained, and immense burdens transported, are too apt to beguile those unacquainted with such matters into the belief that all is accomplished when the wheels are put in motion, when in fact the work is but just begun. Besides the many heavy losses which companies have sustained, the whole railway system has well nigh been brought into disrepute by so fallacious an opinion. A reference to my printed reports, but more especially my communications on file in the office of the company, will show the great anxiety I have felt, from the very commencement of your improvement, to leave the management of your road in competent hands.

In my report of 1836, nearly twelve months before the completion of the railroad, in my remarks under the head of transportation, I observe, in relation to the agent, that the various and complicated duties to be performed by such an officer after the completion of the road—including the enforcement of established regulations, the insti-

tution of such rules as may be found necessary for the well ordering and conducting of the affairs of the company, the disbursements, repairs of the road, and frequently important negotiations—indicate the necessity of filling the appointment with one whose thorough knowledge of business, enlarged and liberal views, qualify him for its duties. And again I observe the connexion of this with other improvements, with steamboats and stage lines, and the collisions and differences which cannot fail to arise, attach to your agent a responsibility of no ordinary character, and require the exercise of great firmness, with a full and comprehensive understanding of the rights and interests of the company. And in my last annual report, after adverting to the many advantages resulting from a connexion with other improvements in progess, and the great addition thereby to your income, I say that even with such brilliant prospects, the road cannot succeed without the most skilful and prudent management of its general operations, and the strictest economy in the application of its resources; and this can only be insured by able and zealous officers, and I now take the occasion to repeat that no advantages, nor can any combination of circumstances counteract the effects of bad management, and I reiterate that with prudent and skilful management, your road cannot fail to be productive.

The repairs of the road since the 1st of January, notwithstanding the many disadvantages under which they have been made in the short days of the most inclement winter months, and the advantage always taken of urgent necessity, such as existed in the crippled state of the road between Portsmouth and Suffolk, have only cost $4762 35: of this $2711 17 have been expended between Portsmouth and Suffolk, and the remainder $2051 16, between Suffolk and Weldon. There are now engaged in the repairs of the road, five overseers and thirty hands. It is necessary, however, and directions have accordingly been given to increase this force to about 60 hands for a few months, with the view of removing the earth from the rails which was beaten down against them from the horse-path by the rains of the past season, and the weeds and grass which were permitted to decay and lodge around the timbers, and which are now springing up with renewed vigor, and, if not soon removed, will totally destroy the road.

All experience has proved the advantage and the economy of keeping on hand a supply of timber. Contracts are made cheaper when it is known the demand is not pressing, and by being seasoned before used, the durability is much increased. I have accordingly contracted for about three hundred thousand feet of rails and thirty thousand sills, to be delivered in the course of the year. This amount will be sufficient for the present, and will leave a good supply on hand for the ensuing year. I have also given directions for the erection of suitable sheds for the preservation of the timber, and for buildings contiguous to them, for the accommodation of the overseers, and hands engaged in the repair of the road, who on rainy days, can be occupied in dressing and preserving the timber for use.

The road between Portsmouth and Suffolk was completed in the summer of 1834. The superstructure consists of heart pine rails 7 by 5 inches, keyed into oak, pine, chinquepin, sassafras, and cypress sills, 8 feet long and from 10 to 14 inches in diameter, flatted on one side and placed 4 feet apart. The iron on this portion of the road is $\frac{5}{8}$ by $2\frac{1}{4}$ inches. Between Suffolk and Weldon, the superstructure is on the same plan as the above. The iron is $\frac{1}{2}$ by 2 inches; the rails are 5 by 9 inches, keyed into sills of oak not less than 12 inches in diameter, and placed 5 feet apart. The timbers were laid at different periods between the summer of 1834 and the winter of 1836. The repairs on this portion of the road, during the present year, will comprise the renewal of about one-sixth of the timbers between Suffolk and Blackwater, and but very few for the remainder. Between Portsmouth and Suffolk it will be necessary to replace at least three-fourths of the timbers. The bridges will require very partial repairs. But few of them need any. Whenever it is necessary to renew any portion of the road entirely, I would advise the adoption of the superstructure recommended by me for the Roanoke, Danville and Junction Railroad, and which is now being put down on the Wilmington and Raleigh Railroad. By this plan, the rails are fastened on the tops of the sills by trenails and knees, instead of being keyed as they ordinarily are into the sills. This renders it necessary that the sills should be *square* and *entirely of heart*—and indeed the necessity of the last requisite is no less important upon any plan, for the sap not only rots in the course of a few months, but promotes the rapid decay of any timbers in contact with it, and therefore the contracts herein reported are for heart sills.

I have stated that the engines are now and have been running with great regularity. The time consumed in the daily trips over the road, (including delays) is $6\frac{1}{2}$ hours. Deducting detentions for wood and water, it gives for the travelling time $5\frac{1}{2}$ hours, being a speed at the rate of 16 miles per hour. This statement, compared with the state of things which existed just prior to my taking charge of the road, (as for example, the cars were from $2\frac{1}{2}$ to 3 hours in running between Portsmouth and Suffolk, a distance of $17\frac{1}{2}$ miles,) gives an idea at once of the improvement in the condition of the road. It is now in good repair; but to keep it so, will require the most constant attention. I would hereby remark, while on the subject, that the arrangements which have been made, contemplate the most thorough repairs in the course of the present year. The interests of the company, and their duty to the public, require that the road should be kept in the best possible order.

I have next to state the condition of the motive-power and vehicles of transportation. When I took charge of the road, the two heavy engines, before mentioned as having done so much damage to the road, were condemned by me, on account of their weight, (though in other respects very superior machines,) and under an order of the board to sell them, a contract has been made with the maker to exchange them for lighter engines. Of the remaining five engines, there was but one in running order—the other four had been improperly condemned by the late foreman of the shops, as will appear by the annexed return which exhibits the performance of the locomotives, and the cost of the repairs for the months of January,

February and March, during which period as well as during the month of April, there have been three and often four engines on the route daily. There are now 70 cars and 6 coaches on the road. Two eight-wheeled coaches have been contracted for. One may be expected in a few days, and the other in the course of a few months. I have also contracted for 40 cars, to be delivered in the course of this year.

The agents of the company are all acting under the written regulations which were placed in their hands when the road was first opened for transportation, (but which had been neglected,) and not the slightest accident has occurred since the 1st January. With the view to additional security and to guard against any delay that might be caused by the machinery of the passenger train giving way, the freight is transported by a separate engine following that which conveys the passengers, and keeping just in sight. The engines are all provided with alarm bells, and the train agent is directed to take his seat on the top of the baggage car, where he can overlook the train, and keep always in his hand, a rope attached to the bell on the engine, and besides the break which he himself can apply, the trainmen are kept constantly at the breaks while the train is in motion—and indeed every precaution dictated by experience here as well as elsewhere, has been taken to guard against accident, which, should it occur, (provided the present regulations are strictly enforced,) will be beyond the power of human foresight to control or guard against. By referring to the annexed table, it will be seen that the amount of the receipts during the past year, is $49,371 11. For the months of January, February and March, the receipts, are $11,479 43, and the expenditures on account of the repairs of locomotives, cars, coaches, the repairs of the road, and the salaries of agents and superintendents is $14,856 86—every item of which, as will readily appear from what I have said, must exceed by far the average expenses of the road. By reference to the pay rolls filed in the treasurer's office, it will appear that the expenditures in the shops for the month of March, amount to very little more than one-half of the expenses for the month of January. In the latter, the amount is $1,867 41, making a saving of $916 79.

Supposing the fiscal year to end on the 30th April, the accounts of the company for the ensuing year may be stated as nearly as may be as follows:

Received.

On loan from the state,	$150,000
For gross amount of transportation,	80,000
	$230,000

Disbursed.

Paid the outstanding debts,	$115,000
Charges on transportation including repairs to the road,	50,000
Interest on $150,000 at 5 per cent.,	7,500
For timber on hand, and sheds,	20,000
For cars and coaches,	14,000
For warehouse in Portsmouth,	10,000
For contingencies,	3,500
Cash on hand,	10,000
	$230,000

It will be observed that, in the foregoing estimates, I have anticipated an increase in the receipts of the road for the ensuing year of about $30,000. When it is considered that the receipts have not fallen off during the past, by far the most eventful year in the history of our country—unparalleled in commercial distress, and the prostration of every branch of industry, paralyzing alike the most gigantic national enterprises, and the efforts of the wealthiest as well as the most humble individual. In retrospect of these distresses which have pervaded our land from one extremity to the other, and the many untoward circumstances, which have tended to embarrass the company, we have shown that the road has prospered—may we not therefore anticipate an increase in the receipts from the awakening energies of the country?

In the discharge of the arduous and responsible duties which have devolved on me during the last four months, I have been most efficiently aided by Capt. Charles Dimmock, whom I would beg leave to recommend as an able and efficient officer, every way worthy of trust and confidence.

In conclusion, gentlemen, I have to state that I now resign the office of "general agent and superintendent of the affairs of the company," so flatteringly bestowed on me by a unanimous resolution of your board of the 1st of January last.

I am, gentlemen, very respectfully, your obedient servant,

WALTER GWYNN, *Civil Engineer.*

Portsmouth, 1st May, 1838.

Report of the Annual Committee.

The annual committee appointed at the last general meeting in July, have, as far as practicable, performed the several duties required of them, by "examining into the condition of the road," "inquiring into the management of the same, and the manner in which the books are kept," and by recommending to the directory, as far as they were competent, such measures as in their opinion would tend to promote the permanence and value of the road."

They entered upon their duty about the middle of November, by visiting and viewing the entire line of the road. The first eighteen or twenty miles of it commencing at Portsmouth, they found to be in a decaying and disordered condition. That portion of it, especially, which passes through the Dismal Swamp, a few miles east of Suffolk, was in a state which required immediate and extensive repairs. The balance of the line, including excavations, embankments and bridges, was in good order, with the exception of the iron on the rails, the ends of which were, in many places, so loose as to spring above the level of the ways.

The inquiries and examination of your committee into the general management and success of the road, at the period above alluded to, were far from affording a gratifying or satisfactory result. The motive power was inefficient, the water stations at several important points, were deficient of water, and a want of attention at these important auxiliaries to the proposed and successful management of a railroad, was manifest; the trains were delayed on the line, and the detention from this cause was such as to produce so much irregu-

larity in the time of their arrival, at either end of the road, that the complaints of disappointed passengers, were loud and frequent. This state of things continued with some exceptions, until January, when a more efficient system for the improvement, repair and management of the road was adopted.

Your committee made a second tour of examination on the road on the 24th and 25th of last month, April, and found the aspect of things entirely changed. The repairs of the road since their first visit, had been prosecuted with energy, and to the extent necessary to the security and success of the line. The road is now in good order. Measures have been adopted to secure, at all times, a plentiful supply of wood and water, by the improvement of old water stations and the establishment of new ones. The motive power of the road, though not equal to all the purposes of transportation, is more efficiently applied, and the passenger trains travel with speed and certainty, and arrive with punctuality.

Your committee have made a thorough investigation of the books of the treasurer. They have been kept with an accuracy which does credit to that officer. Every item of expenditure is sustained by the proper vouchers, and the arrangement of his books and accounts is such as to present, at a glance, a faithful exhibit of the fiscal affairs of the company. The books exhibit the receipts and disbursements as follows:

Receipts from railroad for transportation, - - - - -	$50,336 64
All other sources, - - -	80,075 35
	$130,411 99

Expended.

The payment of debts,	$36,669 35
The excavation, embankment and other purposes of road,	93,098 98
Balance in hand of treasurer,	643 66
	$130,411 99

Respectfully submitted,
SAMUEL WATTS, *Chairman.*

From the Mining Journal.

ASTONISHING FACTS RELATIVE TO A FORMER ORGANIC WORLD.

"Dr. Buckland now proceeds to the most important and popular branch of his subject—to give a description of the most interesting fossil organic remains, and to show that the extinct species of plants and animals which formerly occupied our planet, display, even in their fragments and relics, the same marks of wisdom and design which have been universally recognized in the existing species of organized beings.

"After giving some account of the supposed cases of fossil human bones, and establishing the remarkable fact of the 'total absence of any vestiges of the human species throughout the entire series of geological formations,' our author passes to the general history of fossil organic remains:—

"'It is marvellous that mankind should have gone on for so many centuries in ignorance of the fact, which is now so fully demonstrated, that no small part of the present surface of the earth is derived from the remains of animals that constituted the population of ancient seas. Many extensive plains and massive mountains, form, as it were, the great charnel-houses of preceding generations, in which the petrified exuviæ of extinct races of animals and vegetables are piled into stupendous monuments of the operations of life and death, during almost immeasurable periods of past time. "At the sight of a spectacle," says Cuvier, "so imposing, so terrible as that of the wreck of animal life, forming almost the entire soil on which we tread, it is difficult to restrain the imagination from hazarding some conjectures as to the cause by which such great effects have been produced." The deeper we descend into the strata of the earth, the higher do we ascend into the archæological history of past ages of creation. We find successive stages marked by varying forms of animal and vegetable life, and these generally differ more and more widely from existing species as we go further downwards into the receptacles of the wreck of more ancient creations. * * * *

'Besides the more obvious remains of testacea and of larger animals, minute examination discloses, occasionally, prodigious accumulations of microscopic shells that surprise us no less by their abundance than their extreme minuteness; the mode in which they are sometimes crowded together may be estimated from the fact that Soldani collected from less than an ounce and a half of stone, found in the hills of Casciana, in Tuscany, 10,454 microscopic chambered shells. * * * Of several species of these shells, four or five hundred weigh but a single grain; of one species he calculates that a thousand individuals would scarcely weigh one grain.'

"Extraordinary as these phenomena must appear, the recent discoveries of Ehrenberg, made since the publication of Dr. Buckland's work, are still more marvellous and instructive. This eminent naturalist, whose discoveries respecting the existing infusorial animals we have already noticed, has discovered fossil *animalcules*, or infusorial organic remains; and not only has he discovered their existence by the microscope, but he has found that they form extensive strata of tripoli, or polieschiefer (polishing slate,) at Franzenbad, in Bohemia—a substance supposed to have been formed from sediments of fine volcanic ashes in quiet waters. These animals belong to the genus Bacillaria, and inhabit silicious shells, the accumulation of which form the strata of polishing slate. The size of a single individual of these animalcules is about 1.288th of a line, or the 3400th part of an inch. In the the polishing slate from Bilin, in which there seems no extraneous matter, and no vacuities, a cubic line contains, in round numbers, 23,000,000 of these animals, and a cubic inch 41,000,000,000 of them. The weight of a cubic inch of the tripoli which contains them is 270 grains. Hence there are 187,000,000 of these animalcules in a single grain; or the silicious coat of one of these animals is the 18,000,000th part of a grain!

"Since this strange discovery was made, Mr. Ehrenberg has detected the same fossil animals in the semiopal, which is found along with the polishing slate in the tertiary strata of Bilin, in the chalk flints, and even in the semiopal or noble opal of the porphyritic rocks. What a singular

application does this fact exhibit of the remains of the ancient world! While our habitations are sometimes built of the solid aggregate of millions of microscopic shells—while, as we have seen, our apartments are heated and lighted with the wreck of mighty forests that covered the primeval valleys—the chaplet of beauty shines with the very sepulchres in which millions of animals are entombed! Thus has death become the handmaid and the ornament of life. Would that it were also its instructer and guide!"—*Ed. Review.*

THE SPRING-WHEAT HUMBUG.

To the Editor of the Farmers' Register.

Back river, Elizabeth-city county, July, 1838.

I have just read with much pleasure, and probably profit, your remarks in your Register of April, 1838, (just borrowed,) upon "Agricultural Hobbies and Humbugs;" and although I am not much pleased with the terms, so far as they depend upon the beauties of style, yet they force upon me that which Blair himself could not more convincingly have done, with all his beauties of composition; and, whilst I might have been pleased with his sounds, without conviction, your number has at least had the benefit of inducing me to the belief, that we will ride our hobbies, and so long as we do so, we are ever in the road to be humbugged. Man has always been, from the days of Adam up to the present time, the mere creature of fancy, and I believe always will be so, place him where you will; and hence his liability to be always taken in with any thing new, or which has the appearance of being so. I believe that we shall always be in search of the "philosopher's stone;" and although satisfied of the fruitlessness of the search, yet, but attack our fancy, and we immediately let loose the reins—our reason becomes blinded—and, before our career of fancy is fully over, we are not bad representatives of Phaeton, in his career of rashness. We are always too ready to believe, at least to credit, all such statements as may be sounded in the gazettes or papers of the day, particularly when they shall be blazoned forth by a few remarks from our worthy editors, who are all men of the people, ever on the alert, placed high on the watch-tower, to sound the alarm; and when, instead of the alarum bell, they are sounding to us news of gladtidings, how ready are we to believe all their statements, and particularly so, if an editorial commendation backs them. This though is not very remarkable; because the farmer or agriculturist, relying much upon facts, yet is very credulous, and is apt to believe that most of the statements which reach him, whether communicated in the pamphlets or papers of the day, or in any other way, so far as they are introductory to any new variety in grain, or any thing else in his line of business, are true. For he, poor simple man, never once thinks that all these great products in corn, wheat, &c. sounded so repeatedly and invitingly to his ears, in many various ways, are for effect; and being honest himself, believes all others so, and hence his liability to imposition.

Such then being the state of the case, let us bring into review one or two instances where this too ready belief has led some of us into error; and I, for one, having fallen into it, take at least this mode of endeavoring, through you, to guard others against it. And although I by no means admit that there is error in the substitution of the twin, or prolific, or Baden corn, (having succeeded in making better crops of that than of any other of the large varieties of white corn,) for the large corn, I agree with you perfectly so far as the Italian spring-wheat is concerned; which, upon this second year's trial, I consider almost an entire abortion. I purchased, in the winter of 1837, of Mr. Hathaway, of Troy, New York, a barrel of the Italian spring-wheat, said to contain 3½ bushels, although, from some cause or other, I do not believe that there could have been in the barrel more than 3 bushels. The barrel was of the large size of flour barrels, and it wanted at least 3 pecks, if not a bushel, of being full; and with this a large proportion of the grains therein were oats—I think at least half a bushel. To one of my friends I parted with a half bushel, (oats intermixed,) and to another a gallon, in the same condition; the remainder I kept and sowed. I picked the oats out of the wheat, before seeding, clean by the hand, and obtained a peck and a half; the remaining part, being wheat, say two bushels, I sowed, at least a part of it, upon very rich land—a chocolate mould, high and light for our section of the country. The richest part was drilled in about three-feet drills or rows. This received, in the course of the spring, two workings with the cultivator or hoe. The other, upon land not manured, was sown broad-cast, in beds 5½ feet wide, and divided only by a narrow cart-road of about ten feet; the land nearly of the same description, with the exception of the difference made by manure. The growth of the drilled wheat was very fine; but the rust attacked it badly. The growth of the wheat not drilled was about as good as the fall or winter-wheat upon our fields in general. But this was perfectly clear of rust; in fact, I could perceive no injury to its growth from any cause. The wheat, both drilled and broadcast, was seeded between the 5th and 10th of April. Its promise, with the exception of the rusted part, answered my most sanguine expectations; and this appearance held good until its change for maturity. I then discovered that climate, or some other cause, had its effect. The grain had all the appearance of wheat badly rusted, or injured from scab or blast; and I should have attributed its shrivelled state to the rust, but as much the larger portion of the grain seeded had no appearance of rust or any other disease, (I drilled only a gallon,) in its stalk, whilst growing, and as the grain in that part which had no rust, was *no better*, in any way, than the drilled, which had the rust, I could not account for it, and have not endeavoured to do so, further than the belief that climate had its effect. To cut short, I reaped it, and stacked: and in February last I got it out, and cleaned 25 bushels. This product from wheat, seeded as late, although the grain was indifferent, I thought a good one, and believed that this year I could make it turn out much better, provided it kept clear of rust, scab, &c., which I was induced to believe would be the case by earlier seeding. I parted with 8 bushels of the wheat, and seeded the balance, 17 bushels, to about ten acres of land,

this year, 1838. Two bushels were sown in January, and the balance in March, from the 20th. It is reaped and in stacks, and I do not believe that I shall get over 50 or 60 bushels of wheat from the whole 17 seeded. It not only was attacked by the rust, but had also scab or blast, and the grain is so light that I am apprehensive that one-third of it will be blown away by the fan. There was a considerable difference in the growth of the January from the March wheat. The January growth was very fine, but the other *so light* and indifferent, that the scythe, as it passed through it, beat down a large proportion of it. I have selected two parcels of the best of the growth of each seeding, and herewith enclose them for your inspection. I discover that the winter frosts killed fully one-half of what I seeded, probably more. The same ten acres would have yielded me this year 150 or 200 bushels of the fall or winter-wheat, (golden straw, such as we seed.) You can readily perceive the loss. I am done with it and all other untried grains, at least so far as untried in our climate. I shall wait to see the experiment made by others in my vicinity, so that I can "see it, feel it, handle it." Should you ever come in this part of our state again, it will afford me much pleasure to see you; not only as an old acquaintance, but that you may set me to rights in some of my odd notions. With sentiments of the highest respect, I remain yours, &c.

P. S. I have made no corrections in this communication, as it is for you alone.

[The foregoing communication was signed by the name of the writer, (and a very responsible name it is); but the postscript placed us in doubt, whether to be directed by its purport, and to suppose this letter, (written, as it is, wholly on agricultural subjects of public interest, and superscribed with our address, as "Editor of the Farmers' Register,") was intended merely for our individual inspection and benefit—or, judging from every thing but the postscript, that it was designed as a communication to the Farmers' Register. With considerable hesitation, because of our unwillingness to place any correspondent in a position which he does not desire to occupy, we have decided on a middle course; that is, to publish the letter, but suppress the signature, which we never presume to use, without the writer's consent, expressed or implied.

Our correspondent (like several others) has drawn from our cautions against novelties which *may* (and usually, in the end, *do*) prove to be humbugs, an inference very different from our intention, and from the expressed words, as well as the general context, of our remarks. So far from advising to not *try* things newly recommended as great improvements or probable benefits to agriculture, we urged then, as we would now, the contrary. Every plausible suggestion of a supposed or asserted improvement, or new source of profit, should be submitted, fairly, to the test of experiment. But, at first, *merely of experiment*, and on a scale so small as not to cause much loss, in the very probable event of disappointment. And in deciding whether the recommendation of any new thing deserve this respect, we should have due regard, not only to the apparent reasonableness of the recommendation, but also to the fact, whether the person recommending is, or is not, a deeply interested salesman of the article in question.

Further—we would pronounce it not only bad policy for self-interest, but a failure in a moral obligation, for a farmer to wait always for his neighbors to incur the risk of failure in new experiments, and never to join in bearing some share of the cost, until others had borne that risk, and proved the benefit, by the *visible* and *tangible* profits resulting. If all were to adopt such a rule of conduct, (as is done, in fact, by the far greater number,) then, indeed, all future agricultural improvement would be hopeless.

Our correspondent has also mistaken us as denouncing the Maryland twin-corn as being inferior, in *all cases and situations*. Not so, by any means. It may well be, and doubtless is, (and so of any other variety,) the most prolific, under some particular circumstances. But we meant to oppose the popular error—that this, or any other supposed grain, can be most productive in *all*, or in many different soils and climates; and to deny the truth of the *principle* of procuring more productive kinds of grain, by the process of selecting for seed the plants which bear the greatest number of ears, or ears with the greatest number of grains, or of grains of certain form and largest size, &c.

As to spring-wheat, we have had but one opinion of its value since the commencement of its culture in this country; and we cannot understand how an opposite opinion could have been held by any person who had read and attended to the European accounts of this crop. This unfavorable opinion, so contrary to that which has been disseminated so extensively in this country, (for the profit of the northern tribe of Hathaways,) has been frequently exposed in the Farmers' Register; and if our correspondent had been prepared to profit by our advice, he would have avoided his heavy loss, by borrowing and reading the numbers of the Farmers' Register, some years earlier than he has done.

Of the two specimens of grain sent, that sown in January, though small, is full and well made. The grain from the March sowing is badly filled, and very inferior in quality. And here an observation should be made, which perhaps escaped our correspondent. It is, that his *partial success*, in the early-sown crop, was obtained by a wide deviation from the practice proposed, and a total surrender of the advantage expected from spring-wheat, to be found by sowing *after winter is over*, and the danger of winter-killing passed. Wheat sown in January, should, in fact, be considered not as spring, but as ordinary or winter-wheat. Much wheat, every season, (though without excuse,) is sown in December, and often does not sprout sooner than it would if sown a month later. But the difficulty, alone, of sowing a crop of wheat in the usually severe weather of January, would be a sufficient objection to any kind requiring such a time for sowing; which, however, is not the case with any kind.

Since writing the above, we have seen an extract from a Staunton paper, which states that the trials of spring-wheat, in that part of the country, have had very favorable results; and, thereupon, the more full

use of that grain is strongly urged. We have here another example of the general fact of the readiness of farmers to be gulled, and the facility with which error is propagated, and fraud succeeds—and the difficulty with which truth is permitted to operate, to guard against either. Probably the experimenters near Staunton are now at that stage of the trial in which our correspondent was last year, and, therefore, are honestly of opinion that, *if due allowance is made for every supposed cause of diminution*, the crop is really promising. Or, perhaps, some who have paid three or four dollars a bushel for their seed, are desirous to make the crop sell as well, and to come in for a little of such large profits as Mr. Hathaway seems to have realized.]

From the Gardener's Magazine.

REMARKS ON THE PROPAGATION OF THE DAHLIA.

Every cultivator of the dahlia is aware of the facility with which it is propagated by cuttings of the young shoots, plunged in a little bottom heat. Indeed, from a single root, under proper treatment, several dozens of young plants may be raised in a short space of time. Consequently, this method is universally adopted by nurserymen; they annually requiring a large stock of young plants for sale; and by individuals anxious to propagate extensively a new variety. But it ought not to be practised by amateurs or others, anxious to obtain fine perfect flowers for exhibition or otherwise. I speak advisedly, and from experience, when I assert, that plants raised from cuttings do not produce equally perfect flowers, in regard to size, form, and fulness, with those produced by plants grown from division of the tubers, the old method of propagating the dahlia. It has been said that plants raised from cuttings flower more abundantly than those raised by division; but to this I am not prepared to subscribe.

Physiological botany readily accounts for the different results of the two methods. The starch or feculent matter, stored in the roots, is intended by nature for the nutrition of the annual shoots, not only until the tubers have formed, at the commencement of the vegetating season, the spongioles necessary for the absorption of the required quantity of papula; but also when that the spongioles are unable, from drought, or other causes, to absorb a sufficiency of nutrient matter, to sustain the rapidly developing and vigorous vegetation.

Plants propagated by cuttings cannot, of course, absorb the nutriment prepared and stored, during the last season, in the tubers of the mother root; and are forced to form spongioles and tubers for themselves. But the fecula contained in these latter is not, till towards the end of the year, sufficient in quantity, or sufficiently ripened by the deposition of carbon, to be in any way serviceable.

The potato might be propagated by cuttings of the young shoots, in the same way with the dahlia; but such plants would not, in the early stages of their growth, be nourished by the starch of the tubers; and, therefore, would neither be so strong and vigorous as plants raised in the usual method, nor would they yield a return equal in weight or quantity.

It is well known that tubers and bulbs, when placed in damp situations (the potato for instance in a damp cellar,) develop their leaf-buds; and that these continue to grow and elongate, without the assistance of rootlets or spongioles, so long as there is any fecula in the tuber or bulb; but that when this is exhausted the stem withers and dies. We hence perceive how important the nourishment derived from this substance is to the vigor of the plant, and why whole tubers of potatoes produce larger crops than are produced by cut sets. Hence, too, we may learn why perfectly ripe sets are so much more certain of success than unripe ones; the fecula in the former being so much the more abundant, and more perfectly elaborated. To the unripeness of the sets is attributable the failure of the potato-crops in some parts of Scotland, in the autumns of 1835 and 1836, and the consequent misery and starvation of the unfortunate peasantry.

I feel no doubt that much of the disappointment and dissatisfaction experienced by buyers of new varieties of the dahlia, arising from these so rarely answering the expectations formed of them, is the result of the system of propagating from cuttings. A good seedling is raised: the grower is naturally anxious to make the most he possibly can of it; he therefore plunges the root in heat, and strikes every cutting he can force it to throw out. The young plants are consequently weak and unhealthy, rarely throw out a good flower during the whole season, and are probably discarded, as undeserving of further notice. My first plant of Brewer's Rival King was a cutting from a root, which had been much worked, and consequently, did not show a good flower during the season. The next year, I grew it from tubers, and also from cuttings: the latter always produced imperfect flowers, but the former beautifully perfect ones. With many other varieties, I have found the same difference between plants raised from cuttings and those from tubers.

I would therefore recommend, in order to secure a good and satisfactory bloom, that the roots be laid, in March, in a damp warm place, such as a forcing-house, gentle hot-bed, or even a cellar; and that when the buds show themselves, each root be divided into as many pieces as may be required, retaining a bud to each piece; and that they be then planted separately in 48-sized pots. The after-treatment is the same as for plants raised from cuttings.

From the Horticultural Register.

FLOWERS, FRUITS, AND TREES.

By H. A. S. Dearborn.

Mr. Breck—The season having been unusually favorable for vegetation, and especially since the 15th of May, the consequent verdant and magnificent appearance of the country, with the blandness and congeniality of the weather, have induced vast numbers of persons to visit the many highly cultivated gardens in the environs of Boston, several of which have attracted universal at-

tention, either from the great variety of ornamental plants they contain, or the beauty of some favorite kinds, that have been managed in the most skilful manner.

Mr. Walker's exhibition of tulips became the first chief point of attraction for nearly two weeks, and thousands were delighted, with the superb display, of that infinitely various and gorgeous family of flowers.

Other towns, it appears, have also enjoyed a like interesting spectacle; but a discrimination must be made between the merit due for quantity, and that resulting from the excellence of the varieties, and the perfection of their development. The enterprising gentlemen of Newburyport and Salem, are entitled to great credit, for the taste they have evinced, in the culture of elegant plants; but it is presumed they do not claim precedence, unless they had also as many kinds, which were as rare and perfect in florescence, as those which Mr. Walker presented; for the mere superiority in number, cannot be considered as giving pre-eminence, in any vegetable production, unless it is of some very peculiar or notoriously useful species.

To obtain bulbs of the best kinds of tulips from Holland, Belgium, France, and England, is very difficult and expensive, as every person has experienced, who has undertaken to introduce any particular plant from foreign countries. The bulbs, generally sent to this country for sale, are the rejected of the large nurseries, as all the most choice and valuable kinds are carefully reserved for the European markets, where the amateur purchasers are numerous, and willing and able to pay the highest price, for the remarkable varieties. Even in our day the extavagant passion for tulips has not entirely subsided, and from 500 to 1500 dollars have been given, within a few years, for a single bulb, while those disposed of, at our auction sales, do not average more than from five to fifteen cents, and often not so much. Some of Mr. Walker's cost in London fifty dollars each, and many of them from ten to twenty.

I have cultivated the tulip during a number of years, and had five thousand in bloom at one time, three thousand of which were in a bed, and the remainder scattered in the borders of the avenues and garden walks; but as a show of flowers, it was, in all respects, inferior to that of Mr. Walker's bed of only eight hundred, from the inferiority of the kinds, small number of distinguished varieties, negligent mode of cultivation, and imperfect florescence.

To give this superb flower an opportunity of displaying all its charming attributes, the soil must be deeply trenched, and enriched by a peculiar compost of thoroughly decomposed barn-yard manure, river sand, and decayed leaves or other vegetable matter, while a screen is indispensable to protect the plants, from the cold night air, the direct rays of the sun, and violent winds, when bursting into flower and during the period of their bloom. This Mr. Walker provided, at an expense of several hundred dollars, in a neat and complete manner, in the form of a beautiful pavilion, which was covered with stout white cotton cloth, so arranged, as to be easily rolled up, and let down, by means of pullies.

Tulips have been a favorite florist's flower for centuries, not only in Holland, but in England and other European nations; and as early as 1630, Parkinson, after enumerating one hundred and forty sorts, observes in his quaint manner, that "to tell of all the kinds which are the pride of delight, they are so many, as to pass my ability, and, as I believe, the skill of any other." He was a celebrated herbist and botanist, and acted in that capacity to James I, and Charles I. His book on gardening is the first which was published in Great Britain, worthy of consideration. It is entitled "Paradisi Insole Paradisus Terrestres; or a garden of all sorts of pleasant flowers, which our English ayre will admit to be nursed up; with a kitchen garden of all manner of herbes, roots and fruits for meate, and sause used with us; and an orchard of all sorts of fruit bearing trees and shrubbes, fit for our land, together with the right ordering, planting and preparing of them, and their use and virtues."

In Parkinson's time tulips were divided into *præcoces*, or early blowers, and *scrotinæ* or late blowers, with an intermediate class of *dubiæ mediæ*, doubtful or middle blowers, as they flowered between the two others. The early blowers, have short stems and the Duc Van Throll is almost the only variety in repute, among modern florists. The great number of distinguished and admired varieties are all produced from the late blowers, which, having tall stems and much finer colors, engross nearly the whole attention of the cultivators of tulips. The modern mode of classing the late blowers by the Dutch florists is as follows.

Prime Baguets, from the French word baguette, a rod, or wand; they are very tall, with handsome cups and white bottoms, well broken with fine brown, and all from the same breeder.

Rigaut's Baguets.—This variety is supposed to have received its distinctive appellation from some individual by the name of Rigaut, who was eminent in this branch of floriculture. They are not quite so tall as the former, but have strong stems, and very large well-formed cups, with white bottoms, handsomely broken with rich brown color, and all from the same breeder.

Incomparable Verports.—A particular kind of Bybloemens. Cups very perfect, cherry-red and rose-color and white bottoms, well broken with shining brown. Some of these are from ten to twenty-five dollars a root.

Bybloemens, or next flowers, called by the French *Flamands*. They have white ground, or nearly so, and are beautifully broken, with shades of purple and a variety of colors. They are from different breeders.

Bizarres, from the French odd, or irregular. Ground yellow, from different breeders, and broken with a variety of colors.

Paroquets, or Parrot Tulips.—The edges of the petals are fringed, colors brilliant crimson and yellow, with shades of bright green; but still they are held in no sort of esteem among florists.

Double.—These are of various, brilliant red, yellow and mixed colors; but, like many other double flowers, are deemed monsters, and not appreciated by flower fanciers, although they have an elegant appearance, from their upright, tall, and firm stems, and crowns of large pæony-shaped flowers, and when scattered, with the parrot, among the small shrubs and other plants in the

borders of avenues and walks, or planted out in separate beds, they have a pleasing effect.

In the catalogue of Mosan for 1820, there are six sorts of early tulips, four of Paroquets, twenty-two double, and upward of six hundred late kinds.

Breeders are such as have been procured from the seed, and consist of one color, which is red, purple, violet, gray, brown, black, yellow, or some other individual color, without any sort of variation. These are cultivated in a rather poor and dry soil, and become broken, or variegated, in in from one to twenty years, and produce new varieties; but so uncertain is the prospect of a favorable result, that but few persons have been willing to make experiments, for after many years of patient and unremitted attention, there may not be one remarkable and choice variety, out of a thousand seedling bulbs. It is from this circumstance, that a new and superb tulip commands the high prices in Europe which have been named, and actually paid, within a few years.

When the tulip has broken, the colors are unchangeable, and are perpetuated by offsets from the parent bulb.

The tulips which are deemed worthy of special attention, by amateurs, belong chiefly to the classes of Bizarres and Bybloemens; and the properties of a fine variegated late variety, according to the best modern florists, are as follows:

Petals of a graceful form, the three exterior ones larger at the base than those of the interior; colors delicate, yet conspicuous, from the manner in which the tints are displayed, whether spotted, striped, feathered, blotched, splashed, pencilled, mottled, flaked, or as the French more significantly term the breakings of this flower *panachè*; edges entire and rounded, or but slightly crenated, at the summit, and so symmetrically arranged, as to form a perfect cup-shaped corolla, with a round bottom—except in some anomalous and remarkable kinds, like that called the mountain of snow, whose petals are slightly acuminated, recurved, a little undulate, and the flower leaning to one side. Stem strong, upright, and nearly thirty inches high; radical foliage, long, broad, undulating, and of deep rich green. The ground color of the bottoms of the cups should be clear, white, or yellow; the centre of each petal should contain one or more bold blotches or stripes, intermixed with small portions of the original color, abruptly broken into many irregular obtuse points. The colors which are generally held in the greatest estimation, in variegated striped sorts, are black, golden-yellow, purple, violet, rose, and vermilion, each of which being varied in different ways; but such as are striped with three different colors, in a distinct and unmixed manner, with strong regular streaks, and but little or no tinge of the breeder, are considered the most perfect.

An uncle of Mr. Walker, who resides near Windsor Castle, is celebrated for his tulips and ranunculuses, having produced several magnificent varieties of the former and many of the latter from the seed. His exhibitions of those universally admired flowers have been so superb, that his garden has been annually visited by the sovereigns, nobility, and that numerous portion of the population, of Great Britain who have a taste for ornamental plants. From him, the nephew has received many of his superior roots.

Besides the commendable exertions of Mr. Walker to present an interesting display of well cultivated and choice tulips, he has eminently succeeded in raising from imported plants and seed, numerous new varieties of the *viola grandiflora*—the most admirable of that large family of charming flowers. He has, in fact, made this large and brilliant pansy, known to New England, by the extensive seminaries, which he has established, and the multitude of plants which decorate his ground. He had seven hundred varieties in bloom at the time his tulips were in flower, and the corollas of some of them, were more than two inches in diameter. He also cultivates the ranunculus—one of the most delicate, beautiful, but difficult of all herbaceous perennial plants, to bring into a full and perfect florescence. He has two beds, this season, containing over two thousand tubers, and one hundred and thirty kinds, which, if the weather should not have been too hot, will present an exhibition of flowers as rare and interesting as that of his tulips.

To the above-named plants and the dahlia, Mr. Walker has devoted his sole attention, leaving to others the vast field of floriculture for the selection of their favorite flowers, and the distinction they have attained, or may acquire, from the intelligence, skill, and industry bestowed on their cultivation, and that complete success, which so amply rewards the ardent amateur.

The necessity of a division of attention to the several departments of ornamental and useful plants, is as obvious, as that of labor in the mechanical arts; and the advantages derived therefrom are as certain, as they are conspicuous and satisfactory.

Colonel Wilder is unrivalled, in this country, in the number, variety and successful cultivation of the camellia, the rhododendron, azalea, and rose, having over three hundred kinds of the first, and upwards of four hundred of the last named plants.

Mr. Manning, of Salem, has the largest variety of pears, he having made that delicious fruit his favorite object of culture, while the apple and plum have claimed his next regard. Mr. Wm. Kenrick is well known for his extensive and well-managed nursery of forest, fruit, and ornamental trees, shrubs, and herbaceous flowering plants; and for several years he has made most honorable efforts to introduce the morus multicaulis and other valuable species of the mulberry, for affording the best aliment to the silk worm. He has also the merit of establishing the first extensive nursery in New England, and has published a very interesting and useful work on fruit trees. He, with Mr. Manning, first succeeded in obtaining Mr. Van Mon's new kind of pears, and he has a collection of that kind of fruit trees, of great value, from the number of varieties.

Mr. Pond, of Cambridgeport, has become eminent for rearing large numbers of plum-trees of the most choice varieties, and also for his superior mode of raising asparagus.

The Messrs. Winship of Brighton, have a vast nursery, a large green-house and forcing-house, in which are collected a greater number and variety of useful and ornamental trees and plants, than are to be found in any other like establishment north of Long Island. Their importations of European forest-trees, and exotic shrubs, and herbaceous flowers, have been extensive, and contributed, in an eminent degree, to extend a taste

for rural embellishment in the eastern section of of the union. Their collection of foreign new kinds of roses, rivals that of Col. Wilder, as they have some 500 varieties. Pæonies have also claimed their special attention, and they exhibit nearly 40 kinds.

Other highly commendable efforts have been made to multiply the fruits, culinary vegetables, and plants of all kinds, and especially by seeds. The establishments of Joseph Breck & Co., and of Hovey and Co., are well known, for they have so far kept pace with the rapidly increasing demand, and have so faithfully discharged their very responsible duties, in either raising or collecting the best varieties and of the most perfect quality, that they have merited and received the grateful acknowledgments of their numerous fellow citizens, who "drive their team a-field," or delight in the society, or the culture of the silent, yet eloquent, beautiful, useful, and ever interesting families of the vegetable realm.

As proprietors and editors of three of the most valuable agricultural and horticultural publications in this country, we are under the greatest obligations to them; and it is earnestly to be wished, that for all their diversified and indefatigable labors, they should receive that encouragement and reward, which will render their patriotic exertions annually more profitable to themselves, and useful to the public. In the diffusion of intelligence among the farmers and gardeners, and the extension of a taste for their honorable and important occupations, as well as for the improvement of the aspect of the country generally, by inducing a greater attention to all the branches of cultivation, those periodicals have already accomplished much, and if they receive that liberal patronage to which they are justly entitled, the beneficial results will be as universally conspicuous as they are desirable.

The new garden at Mount Washington, with its ranges of green and forcing houses, is becoming an object of great interest, and will soon rank among the first, which are now the most celebrated, as the intelligent and experienced Mr. McCollough has fully shown that he is well qualified for the station he has assumed.

The Charlestown vineyard, with its departments of other fruits, conservatories, graperies, and valuable, as well as ornamental plants, has given a well deserved reputation to the Messrs. Mason, from the successful manner in which the whole of their spacious establishment is managed.

The valuable, new, and excellent varieties of the strawberry, with which our market is enriched, have rendered Mr. William Mason of Charlestown, and Mr. J. L. L. F. Warren of Brighton, celebrated, for the zealous and successful exertions they have made to grow that delicious fruit. The Downton, Wilmot's, Keen's Seedling, Roseberry, Mulberry, Methven Castle, and other distinguished new kinds, are now abundant, and maintain the high character which they had acquired in England.

Mr. Town, of Snowhill street, in Boston, has a neat and well-conducted green-house, which may be truly called a floral gem.

There is an humble little cottage garden on the Dorchester road, near Grove Hall, which reflects great credit on the unassuming and respectable old man, who carefully tills it with his own hands; and many a passer-by has stopped to admire his beautiful collection of choice varieties of pinks. May he be made happy in his commendable efforts to contribute to the happiness of others, is a blessing which every visiter must spontaneously bestow on the venerable Meller, and at the same time, attempt to enable him to realize the benediction, in the purchase of a single root, or a bouquet of flowers. How interesting and imposing is it to behold the aged calmly and studiously engaged in the culture of a garden of flowers. They appear to be appropriately occupied in a kind of religious rite, and as if actuated by a presentiment that their end was near, devoting their last moments in the preparation of the materials of a garland for the decoration of their own grave, and thus seeming to ask the grateful tribute of approbation, from a life industriously and reputably passed, and now approaching its close, in the anticipation of that good name which all desire, and hope encourages us to believe may have been attained, and will be perpetuated when "we sleep in the narrow house of death."

There is very much wanted a large nursery of native forest-trees, where they shall be raised in such quantities, as to be afforded to purchasers at as cheap a rate as they can import them from England and Scotland. So great is the demand, that not only our nurserymen, but many individuals, have recently imported vast numbers. Two gentlemen, one residing in Watertown, and the other in Salem, have received ten thousand each, this season, which cost only a few cents a-piece. The quantities which might be sold, if furnished at even a liberal price, would be enormous; but the expense of obtaining trees from the forest, the mutilated manner in which they are taken up, and the consequent difficulty of making them flourish vigorously, deters those who would be glad to embellish their estates, or plant out wood-lots, or groves for timber, from making the experiment.

The rapidity of the growth of seedling trees, reared in nurseries, compared with such as are selected from the forest, is well known to those who have attempted the culture of both kinds.

A pleasing illustration may be seen on the magnificent ground of Col. Th. H. Perkins, who imported about thirteen years since, 15,000 plants which were not more than two feet high, and now they are large, healthy and beautiful trees.

Very respectfully,

Your ob't. servant,

H. A. S. DEARBORN.

Hawthorn Cottage, Roxbury, June 20, 1838.

From the Mining Journal.

ANTI-DRY-ROT.

The following letter has been addressed to the the secretary of the Anti-Dry-Rot Company, by Mr. Samuel Beazley, the architect.

"SIR—At the commencement of the year 1836, I surveyed and accurately examined the posts and paling in the Regent's Park, for the purpose of ascertaining the comparative states of those timbers which had been prepared by Kyan's patent, and those which had not been submitted to the process of solution. In my report of that period, I

stated that indications of decay were already perceptible in most of the unprepared timbers, both at the bottom of the posts, and in those arris edges and ends of paling which were placed, or had come, at all, in contact with the earth, while those timbers which were marked as having passed through the solution, were quite free from any such symptoms. I now beg leave to state, that I have this day, after a lapse of two years and a quarter from my previous survey, again accurately examined several of the same posts and paling, digging away the earth from the foundations for that purpose, and find that the symptoms of decay mentioned in my preceding report as having commenced in the unprepared timber, have so considerably increased, as to have rendered the bottoms of the posts completely rotten, to a depth of from one to two inches, and that, in several instances, fungi have been the consequences of the decay; while I find the prepared timbers which are in the earth sound and in the same state, with the exception of mere discoloration upon the surface, probably arising from the damp state of the earth at the time of its removal. As a farther proof of the difference existing between the unprepared and the prepared timber, we could cut with the greatest ease large pieces from the former with the spade, without using any force, while it required great exertion to chip off very small pieces from the latter."

From the Farmers' Magazine.

TEMPLEMOYLE AGRICULTURAL SCHOOL.

Any one who duly reflects upon the infinite importance of giving to the youth of our country an education wisely adapted to their prospects in life—to the peculiar character of an American citizen—to the nature of our institutions,—to our social polity and republican habits—must, we think, regret the failure of the bill so favorably introduced into the legislature, and so ably supported, of establishing a School of Arts under the supervisions and management of the Franklin Institute. It might be difficult to add much to the arguments so forcibly urged by the principal advocates of the bill; and we cannot but believe, that extended observation and maturity of reflection will eventually satisfy every parent and guardian that he could make no better provision for the prosperity of a son or a ward, destined to fill an active and productive sphere of life, than to place him in a school where, in addition to the requisite amount of literary instruction, he may acquire a knowledge of those practical sciences, to which his time and energies must necessarily be devoted. Such a school as that whose outlines and objects were presented to the legislature, would furnish incalculable advantages to those who have in prospect an engagement in any of the arts, trades and manufactories which are becoming so immensely important to the wealth of our country. To those whose views are more exclusively agricultural, such establishments as the one described in the subjoined article would be worthy of all imitation.

G.

To the Editors of the Irish Farmer's and Gardener's Magazine.

Gentlemen—You will render a service to Ireland, and advance the interests of that branch of her industry (agricultural) whence she derives her principal resources, by giving a place in your widely circulated pages to the following account of an establishment now in operation for ten years, the extension of which, and the formation of similar schools elsewhere, are the sole rewards aimed at by the noblemen and gentlemen who were the founders of it, of whom many are still zealous, as the committee of management, in promoting its success.

I have the honour to remain, gentlemen, your ob't. humble serv't.

ONE OF THE COMMITTEE.

The Agricultural Seminary of Templemoyle originated at a very numerous meeting of the North-west of Ireland Farming Society at Londonderry, and it was at first intended that it should consist of two establishments, taking Mons. Fellenberg's Institution at Hoffwyll in Switzerland in some degree as the model: the first to be a school affording instruction in every science and accomplishment aimed at by the children of the higher orders; the second for the education of the sons of respectable farmers and tradesmen, in the hope of disseminating the advantages of an improved system of farming with greater certainty by combining the practice and theory of it in the instruction of those who were afterwards to make agriculture their pursuit, it was hoped, that the extended scale of the institution would have allowed of a greater variety of masters and lecturers, and that the profit derived from the superior school would have contributed towards the maintenance of the secondary one; but a short experience convinced the subscribers that such a scheme was impracticable without much larger and more certain funds than they could rely on; they then gave their undivided attention to the agricultural seminary, which through their increasing exertion has attained such eminence as may justly entitle them to look forward with confidence to its increasing usefulness, and to its becoming a model for establishments of a similar nature in other parts of Ireland.

The school and farm of Templemoyle are situated about six miles from Londonderry; about a mile distant from the mail-coach road leading from Londonderry to Newtowlimavady. The house, placed on an eminence, commands an extensive and beautiful view over a rich and highly cultivated country, terminated by Lough Foyle. The base of the hill is occupied by a kitchen and ornamented garden, cultivated by the youths of the establishment, under an experienced gardener. The ground between the garden and house is laid out in beds in which all the different grasses, clovers, &c., are cultivated with the greatest care. The house is in the form of an $||=||$, with ranges of farming offices behind, containing spacious, lofty, and well ventilated school-rooms; refectory, dormitories, apartments for the masters, matrons, servants, &c.

Each pupil occupies a separate bed; the house can accommodate seventy-six, and the number of pupils amounts to sixty. They receive an excellent education in reading, writing, and arithmetic; book-keeping, mathematics, land-surveying, and geography. This department is managed by an excellent head master and assistant master, both resident in the house. The pupils are so classed that one-half are receiving their education

in the house, while the remainder are engaged in the cultivation of a farm of 130 Cunningham or 165 statute acres, in the management of which they are directed by the head farmer, an experienced and clever man, a native of Scotland, who has a skilful ploughman under him. The pupils who are employed one part of the day on the farm, are replaced by those in the school, so that the education always advances in and out of doors *pari passu*.

The pupils are thus instructed in all the practical parts of farming, and are also lectured several times a week on the theory of agriculture. They are made acquainted with all the properties of different soils, the manures most applicable, and the crops best adapted to each; points in which most of our practical farmers display great ignorance. They are also made acquainted with all the numerous varieties of cattle, and their qualities, such as early maturity in some breeds, hardihood in others; and have strongly impressed on them that one of the most essential points in farming, is to select the cattle and the crops best adapted to the situation, soil, &c.

The stables, harness-rooms, cow-houses, winter-feeding houses, piggeries, barn, tool-houses, are arranged in the best manner, and the pupils are required to keep them and their contents in the highest order. A respectable and intelligent matron has the superintendence of the dairy, cooking, and cleaning the house, and the charge of the domestic servants.

The formation of this establishment has caused its founders an expenditure of above four thousand pounds; of which about three thousand were raised at its commencement by shares of £25 each, by the noblemen, gentlemen, and members of the North-west Society. The Grocers' Company, on whose estate it is situated, have been most liberal in their assistance, and have earned a just reward in the improvement of their property, by the valuable example the farm of Templemoyle presents to their tenantry; and it is gratifying to state, that the example is not confined to so limited a circle, but is followed, to a very great extent, by the farmers to a considerable distance.

In sending a pupil to Templemoyle it is necessary to have a nomination from one of the shareholders, or from a subscriber of £2 annually. The annual payment for pupils is £10 a year; and for this trfling sum they are found in board, lodging, and washing, and are educated so as to fit them for land-stewards, directing agents, practical farmers, or surveyors, schoolmasters, or clerks.

From fifteen to seventeen is the age best suited for entrance at Templemoyle, as three years are quite sufficient to qualify a student possessed of ordinary talents and a knowledge of the rudiments of reading and writing, to occupy any of the above situations. If this very short and imperfect sketch of what must and will become a more generally useful institution, as it is more known and appreciated, should lead the reader to wish any fuller information, he may easily be gratified by visiting the agricultural seminary, or by applying to the zealous secretary to the committee, Pitt Shipton, esq., Londonderry, under cover to Sir R. A. Ferguson, Bart, M. P., who will furnish printed reports containing the history of the rise and progress, the names of the shareholders, the rules and regulations of the society, hours of school and labor, dietary, and a variety of minutiæ, which, though extremely valuable and necessary to be known, yet from their length might prevent the insertion of this outline of the Templemoyle Seminary in those works which, from their circulation, may both increase the utility of the publication, and the knowledge of an institution of which the advantages have been felt and appreciated in the north of Ireland.

N. B.—Upwards of two hundred young men, natives of sixteen different counties in Ireland have passed through, or remain in the school. Of these between forty and fifty have been placed in different situations, such as land-stewards, agents, schoolmasters, and clerks, or employed on the ordnance survey. Nearly one hundred are now conducting their own or their fathers' farms in a manner very superior to that of olden time; and the accounts of those who have been placed from the seminary are such as to gratify the gentlemen who have its interest at heart, and to convince them that the good seed sown is producing an ample and valuable harvest.

Templemoyle, Oct. 14, 1837.

[It gives us unqualified pleasure to lay before our readers the above gratifying account of an institution so eminently calculated to confer lasting benefits upon the country. We have been long strenuous advocates for the establishment of agricultural schools in all parts of Ireland, feeling assured that they would ultimately be the means of breaking down those absurd prejudices which have been hitherto the most insurmountable obstacles with which agricultural improvement had to contend.—*Editors.*]

NEW PLAN PROPOSED FOR DUNNING DELINQUENT SUBSCRIBERS. MARYLAND TWIN-CORN.

To the Editor of the Farmers' Register.

Chillow, April 20th, 1838.

Dear Sir—Enclosed I send you ten dollars; whether more or less than the amount due you, I can't say; if less, please advise me by an account upon your next number.

You publish in every number the names of those who make payments; why not publish on another leaf the names of delinquents and the amount due by each? I think it would be an excellent regulation. It would have very much the effect of mounting a truant school-boy upon a "dunce-block"—none ever desire to attain that honorable destinction a second time, nor would your subscribers ever desire to appear twice upon the delinquent list. In ninety-nine cases of a hundred it is procrastination, and not inability to pay, that keeps us delinquents from forwarding our subscriptions. It would be a cheap and sure substitute for the impertinent little gentlemen who so uncivilly remind one "that they will be glad to get your subscription for the Farmers' Register, Whig, Enquirer," &c.

In your article upon "Hobbies and Humbugs" you quote from Mr. Carmichael the following, viz: "My experience (speaking of the Maryland twin-corn,) induces me to think that no great advantage is derived, if this corn is planted on lands naturally poor, or exhausted by cultivation; but

when in a state of fertility, either naturally, or by improvements. I think the [increase of] product from this kind of corn will be more than fifteen per cent. My whole crop the last year was Maryland twin-corn, and I thought I observed a manifest advantage from its cultivation upon bottom land and good up-land. I am not prepared to say what per cent. it yielded above the average crops of common corn heretofore made upon the same land; but it was, I am perfectly sure, much the heaviest crop I ever saw upon the bottom and good up-land. I should *guess* at least by one-fourth. The case, however, was very different upon the exhausted parts of the field—for there, the corn over-shot, and produced very little more than stalk and fodder. It will not do, so far as my limited observation extends, upon any other than land that is (in common parlance) in "good heart," so well as our old corn, viz: gourd-seed and Dearing corn.

This, however, I do not consider any objection, for no man ought to put exhausted land in any crop for profit; for, if he does, he will verify the vulgar maxim of "working for nothing and finding himself"—this I have learned by sad experience. I have tried it ten years, and have always found my profits on the wrong side of the leger—and of a man who would have the nerve to push such an experiment farther, it might be truly said, that "there is more hope of a fool than of such a man." Can you not coax some good man of meadows to give us more light upon the art of grass culture? For one, I should be very thankful if you would convert a part of your domain, (the Farmers' Register,) into meadows of a standing pasture, where we corn-fed nags might luxuriate in fine grass; and mix hay with our grain—*Verbum sat.* With hearty good wishes for the success of your efforts, I am, dear sir, your obedient servant,

P. A. Bolling.

REMARKS SUGGESTED BY THE PLAN ABOVE PROPOSED.

If all subscribers were as well disposed as our correspondent, to be reminded of, and to correct, their errors of omission or procrastination, then the very simple and cheap plan of notification which he proposes, would save a great deal of trouble and of expense, of vexation and sore feeling, both to the publisher and to delinquent subscribers, which is now necessarily incurred, in the sending bills separately (and often repeatedly) by mail, and the maintaining the usual system of collecting debts through travelling agents. And though (for reasons stated at large in a former number) the use of collecting agents, in Virginia, has been entirely abandoned for this publication, the discontinuance of that mode of personal application makes written applications the more necessary, and leaves in action abundant sources of discontent and displeasure to persons so notified, and of vexation, and wounded feelings, besides "patronage" forfeited, and pecuniary loss incurred, by the publisher. This is, by far, the most disagreeable and galling of all the burdens which the publisher of a periodical work has to bear. It is not so much the enormous per centage of loss, upon the whole amount of debts due, that is and must be sustained, as the numerous cases of offence, unintentionally given, and not unfrequently of greater offence, intentionally returned, in consequence of the mere notification to delinquent subscribers of their dues, in such general form, of circular letters or otherwise, as the cases in general require. No man, who has the sensibility of feeling, and delicate sense of honor, that a gentleman should have, would undertake the endurance of this odious duty and burden, if he knew its magnitude before he commenced the labors of editor and publisher. For our own part, we thought that the plan of printed receipts for monthly payments, which was adopted from the beginning of this work, would prevent any continued ground of mistake or misapprehension of subscribers, or of just complaint on that head; and leave us no ground for the "wear and tear" of feeling, and of temper, in contemptible and irritating contests about five-dollar debts. In these printed lists, (unless omitted by mistake,) the payment of every subscriber appears in the month in which it is received; and the preservation of that cover, or a mere reference to it, is the most convenient and best of vouchers, inasmuch, as so many hundreds are printed, that it is scarcely possible that every copy of the receipt can be lost. Moreover, the notification of any omission or mistake in these receipts is requested in every list, and immediate correction of all such promised; and in every case of information of error, whether given early or late, (and no matter how defective the proof,) the correction has been promptly granted. With such ample means afforded by our regular usages, it is manifest, that if any subscriber is overcharged, (by omitting his proper credit of payment,) and remains so, it is his own fault, in not furnishing the means of correction. With all the care that can be used, some mistakes, and consequent overcharges, cannot be avoided; but no such overcharge can remain two months on our accounts, if subscribers will merely look for their names in the lists, preserve the copy, or a reference to it, and give notice of errors discovered. With such a system, the publisher may *lose* in many cases by mistakes made in entries, but cannot possibly *gain* by one. And it is as foolish and unreasonable as it is unjust, for any overcharge to be imputed to design, which would be an act of dishonesty as contemptible in its object, as for its motive. We have committed very few mistakes of this kind, compared to the number made by our subscribers—and much fewer than their mistakes of the opposite kind, where they have paid more than they owed, and consequently were credited for a year more than they expected. It never entered our mind to suspect that any subscriber meant to defraud, by his statement of his dues and payments falling short of the true amount; and when the publisher has every thing to lose, and nothing to gain, by similar mistakes and misstatements of account, surely he is entitled to at least as much indulgence and respect.

But the mere possibility of any such overcharge existing, would be a sufficient objection to the plan proposed, of printing the list of names of all supposed

indebted subscribers; and, besides, we should be very unwilling to take that mode of reminding debtors, who had not been *very* forgetful of, and remiss in, performing their obligations. But neither objection applies to cases of long-continued neglect and denial of payment, even after a year or more has elapsed after the names have been erased from the subscription list, for non-payment of still older arrears. Such a list as this, may be published before another volume of the Farmers' Register is commenced; and we fear (from present appearances) that it will be a long one.

From the American Journal of Science and Arts.

HYDROGEN GAS IN A LEAD PIPE, USED AS AN AQUEDUCT.

In a letter to the Editor from Nelson Walkly.

I was at the house of a friend during the last summer, and while there, he was engaged in laying lead pipe, from a spring to his house, for conducting the water, a distance of three-quarters of a mile.

Between the spring and his house was a hill several feet higher than the spring, and several whose summits were not as high. His house was fifteen feet lower than the spring. He informed me that he had laid down his pipe several times and set the water running, but it never had continued to run over ten days at a time. He had repeatedly taken it up and tried it, supposing it contained a leak. He called on the man whom he had originally employed to lay his pipe, for a cause, and found that he knew nothing, except that the stoppage was occasioned by air, and that air could not get in, unless there was a leak in the pipe. My friend, when I arrived, was taking up his pipe for the last time, to try whether there was a leak. After trying it with a pressure of 50 lbs. to the inch, he found no leak and laid down his pipe, and by means of a forcing pump set the water running again. As formerly, after running less and less for about ten days, it entirely ceased. I then took it in hand, determined to find out, if possible, the cause of the obstruction. I made a puncture in the pipe at one of the high places lower than the spring, and found that the pipe contained not air, but hydrogen gas. I was now more embarrassed than before, as I could not imagine what was the source of the hydrogen. I happened about that time to take a tin cup of water, and noticed a row of minute bubbles along the seam; the thought struck me, that it was the combination of metals in the pipe that occasioned galvanic action sufficiently powerful gradually to decompose the water.

To try it, I put a small piece of the same pipe into a tumbler of water, and after standing two days, I found the pipe covered with a coat of white oxide, with the exception of the seam where it was soldered together, and there the tin which composed the solder was perfectly bright. From this I inferred, that the galvanic action of the pipe on the water produced decomposition, the oxygen combining with the lead, and the hydrogen carried along by the water until it came to the high places in the pipe, and there accumulated until it filled the pipe and entirely obstructed the water.

To remedy this difficulty, I made holes into the pipe at every high place, and soldered over them a vertical tube, open at the top, excepting the hill that was higher than the spring, and to that part of the pipe I soldered a tube similar to the others, with this exception, that I soldered it up at the top. The first mentioned tubes let the gas escape as it came along, and the one on the highest elevation suffered the gas to accumulate in it until a small bubble protruded below the end of the vertical tube, and was detached from the body of the gas in the tube and carried on by the water. After the above arrangement was effected, the water was set running, and has continued to run without any sensible diminution ever since, upwards of eight months. Query, Is not the action of water upon lead, mentioned in vol. xxxiv. p. 25, of this journal, occasioned by a combination of some other metal with the lead?

Tuscaloosa, Ala. May 25th, 1838.

From the Genesee Farmer.

WHITE-WASHING TREES.

The practice of white-washing trees, particularly fruit trees, which at one time prevailed extensively, seems to have been mostly discontinued, but for what reason, is not, we apprehend, generally understood. Washing trees with lime was adopted for the purpose of removing mosses, cleaning the bark, destroying insects, particularly the aphis, and that it was efficient for these purposes, few who have tried it will deny. The objections made against the practice were that the coating of white-wash excluded from the bark the action of air and moisture, and that by causing the rough bark to scale off, the tree was deprived of a covering which might be beneficial in protecting it from frosts in our severe winters. These objections we are inclined, from our own experience and observation, to consider of little weight when compared with the positive advantages of the application. We have never known a tree injured from the white-washing process; on the contrary, we have seen trees covered with the aphis, or with dead rough bark, effectually cleaned, and rendered vigorous and healthy, the bark looking green and the foliage vigorous. To produce the beneficial effects, it is not necessary to have the white-wash laid on of the consistence and thickness of a coat of mortar; but thin and even with a common brush. If the tree is very mossy, or has much dead bark, rubbing it with a stiff broom, or otherwise cleaning the trunk, should precede the application of the white-wash. Experiments have shown, that in nurseries of trees, those that have been washed either with lye or lime, grew much more rapidly than those not subjected to the process. We should be pleased to have the opinions of our farming friends, on this subject.

From the Genesee Farmer.

OIL-CAKE AND BONES EXPORTED FROM AMERICA TO EUROPE.

A vessel lately sailed from New York for England, carrying out more than one hundred tons of oil-cake, for stall-feeding cattle. This shows that the English farmers understand the nature and

value of that material better than we do, or instead of sending it abroad, we should use it in fattening beef at home. The exportation of oil cake we do not, however, consider so suicidal to the interest of the farmers as that of bones; of which, within a few years past, very large quantities have been collected in the vicinity of the principal cities and sent abroad. This is directly robbing ourselves, by depriving us of the means of communicating and perpetuating fertility to the soil. The beef made by the oil cake will not, it is probable, be sent to this country for sale, but from the example of the past, it is very possible that the grain produced by the application of this bone dust may be returned to our shores, when by its use here, the same wheat would have been raised, and the land at the same time permanently benefited. Our farmers will do well to think of these things.

From the Quarterly Journal of Agriculture.

ABUSES OF BONE-MANURE.

The character of bone-dust as a trusty manure for turnips, runs the risk of being depreciated by the injudicious manner in which that manure is sometimes applied to the soil. It is found, in singling the turnip crop, that the bone-dust is liable to be brought up to the surface of the ground by the root-fibres of the ejected plants. From this circumstance, it is conceived, that a stratum of earth betwixt the bone-dust and the turnip-seed would prevent the recurrence of the evil; and accordingly, to effect this purpose, the bone-dust, in some instances, is either dropped into the drill by the hand, covered up by the plough, and the turnip-seed sown in the drill by the common turnip sowing-machine, as in the case of farm-yard manure; or the bone-dust is first sown by one machine, and then the turnip-seed by another, immediately or shortly afterwards. These plans are practised in the borders of England, and Scotland, a part of the country which is occupied by farmers, whose common sense, independently of their agricultural skill, might have warned them against their dangerous consequences. Such a practice could only have originated from giving no heed to the nature of bone-dust, and the growth of the turnip plants towards maturity.

It is clear, that if a stratum of earth intervenes betwixt the manure and the turnip-seed, a *quick* braird of the turnip plant cannot be insured. It was the slow brairding of that plant which formed the ground-work of the universal complaint against farm-yard manure, however well prepared, for raising turnips, on dry soil in a dry season, and especially on strong land in a dry season; and the great recommendation given with bone-dust, was that of its *insuring* the early braird of the turnip-plant in all seasons. The complaint now, under the practice above described and condemned, is, that bone-dust does not insure an early braird of turnip in strong land; but, so long as the practice of placing earth betwixt the manure and the seed is followed, a quick braird ought not to be expected. Contact with manure will cause turnip-seed to vegetate in a short time. Could the seed have been placed in contact with farm-yard manure as easily as with bone-dust, the latter would never have acquired the fame it has as a turnip manure. The firmness with which the roots of the turnip grasp the manure, shows the great capacity for manure which they possess in the early stage of their growth. It is this tenacity for manure of the root-fibres which raises so much of the bone-dust to the surface of the ground, by adhering to the roots of the ejected plants; and whenever turnip seed vegetates in contact with farm-yard manure, the same inconvenience results. In the case of dung being brought to the surface, it there becomes wasted, but in the case of bone-dust, the resurrection of the bones not in contact with the growing plants, is of no consequence, because, while exposed to the air, the bones lose none of their fertilizing properties; and none of them which are brought up escape being again covered by the subsequent operations of hoeing, scuffling, and earthing-up. Although the bone-dust should be scattered between the drills, if it is at all under the surface of the ground, the long and tender fibres from the turnip-plant, which extend a considerable distance around every plant, will eventually derive benefit from it. But even should any of the bone-dust be left exposed to the air, on the surface of the ground, after all the operations are completed, it is much better to suffer that loss, than run the risk of losing the whole crop by improperly checking the braird. Eventually the bone-dust cannot be lost, for whenever, by any means, by ploughing, by tramping of sheep, it is pushed into the soil, it immediately imparts its properties to the soil. The increasing scarcity of bones, and the consequent advance in price of bone-dust, from 2s. 6d. to at least 3s. if not 3s. 6d. per bushel, and which difference of price, small as it may appear, constitutes a considerable additional expense in the turnip-crop on a large farm, has no doubt suggested the adoption of this pernicious practice; but although economy in the use of bone-dust is a laudable endeavour, it should never be attempted at the risk of the well-being of the crop. Bone-dust may be economically used by mixing it with ashes, whether derived from the combustion of coals or peat; or where farm-yard manure is abundant on any farm, let some of it be spread in the drills in the usual form, and the seed afterwards sown along with bone-dust on the tops of the drills. In this case, the manure need not be much prepared, as it will have time to ferment in the ground before becoming useful to the turnip-crop, while one-half of the usual quantity of the bone-dust, namely, one-quarter per imperial acre will suffice for the brairding of the plant and its nurture, until it finally depends for support upon the manure.

On considering the effects of bone-dust on land, it is not improbable that the experience of years may prove the abatement of its efficacy as a manure, after repetition of its application on the same ground. This appears to be the opinion of the Duke of Portland, as expressed in a communication by the duke himself, in Bell's Weekly Messenger of 23d April, 1838. As we know that his grace is an accurate observer of the operations of the field, his statement is worthy of an attentive perusal.

"In 1834, two fields of sand-land adjacent to Clumber Park," says his grace," the one at right angles to the other, each containing about twenty acres, were sown with seeds among barley. Whenever these fields had been sown with turnips for twenty years before 1825, they had always been

manured with bones. In that year they were largely so manured. The seeds sown with barley in 1826 having been burnt up in that dry summer, in 1828 the land in both these fields was again broken up. In 1829 it was again fallowed with turnips and manured with bones. In 1833, both these fields were again sown with turnips, parts of each of which were manured with bones, and the remainder with farm-yard dung.

"In 1834, when the corn was out, it was found that the seeds had failed in each of these fields where the bones had been applied; and that they were very good where they had been manured with dung. In one of these fields the failure exactly followed the line of the difference of the manures, with two exceptions, that the seeds did not quite fail in two spots where formerly there had been dung heaps. In the other field the failure did not so exactly follow the line of demarcation, but the exceptions were very few. Generally speaking, the manured land is better than the boned land, but the difference of quality is not great, the crop of barley on the manured land had been at the rate of five quarters per acre, on the other four.

"Immediately after harvest, fresh seeds were sown on the boned land. They came up very thick, but in six weeks died and disappeared. During the winter the land was again fallowed, and fresh seeds were again sown in the spring of 1835. They cannot be said to have failed, but they were a very inferior crop; and, notwithstanding a manuring of farm-yard dung applied as a top-dressing the following spring, they have not yet recovered a parity with the rest of the fields. In this case it seems impossible to attribute the failure of these seeds, where they have failed, to any other cause than the bones, which had certainly been applied with unusual abundance; and it is the more surprising that such a cause should have produced such an effect, because, in the early periods of the use of that manure, it appeared to be in no respects more advantageous than in its tendency to encourage the growth of the clovers. Of this tendency, the most remarkable instances have been repeatedly seen on very poor land, and none more so than one which occurred on a very poor piece of land prepared for a plantation by a crop of turnips, manured with forty bushels per acre, on which, between the trees, a great deal of clover has spontaneously sprung up. Previously to this land having been broke up for turnips, scarcely a plant of clover was to be seen. Now the fields on which the seeds have failed had (as above stated) received, much more frequently than usual, complete dressings of bones.

"Combining the great advantages of bones on the first application of them with this failure, it seems difficult to avoid the conclusion, that as the bones, while they are new to the land, have produced the most beneficial effects, and as this failure has taken place where their application has been most frequently repeated, the success is in a great measure owing to the novelty, and the failure to the repetition of their application.

"If the preceding statement required any confirmation, it has received it in 1837. In this year, a field which had been turnips in 1836, had been laid down to grass. The north side of this field is very inferior sand-land; and as, till lately, it was supposed that such land would not pay for the expense of bones, they had never been applied to it. For the first time in 1836, bones were used for the turnip fallow. The south side of this field, which for many years has always been manured with bones when in fallow for turnips, was divided into four divisions; the western side was manured with farm-yard dung; that next to it with bones; the two eastern divisions were manured, the one with rape-dust, and the other with malt-culms. After harvest, the seeds on the north side appeared to be best; then those on the western side of the field; then those on the two eastern divisions, which were rather inferior; and those on that where the bones had been applied were visibly the worst. The frost has been so injurious to the seeds, that this difference between the three eastern divisions is not now so marked as it was before the frost; but the superiority of the northern side and the western division is very apparent.

"This field lies nearly opposite to Scotland Farm, on the other side of the road leading from Ollerton to Worksop, and three miles from the latter."

In this statement the soil is described as "*sand*-land:" the rotation followed on it a four-shift, viz. turnip-fallow, barley, grass, and a white crop; and the quantity of bone-dust applied forty bushels per acre. The remarks we would venture to make on this statement are, that a rotation of four is not adapted to any "sand-land" with even an unlimited command of manure; for that course keeps light land too much under the plough, makes it too pulverulent, and thereby endangers its texture with deafness. Such land should always be *pastured* at least two years, and better still for three, in order that it may be consolidated into a firm condition by time and rain, and the tread of animals. It is not stated whether the turnips were wholly carried off the ground, or partly eaten on the ground by sheep. We have, universally in Scotland, a notion that the half, at least, of the turnips raised by means of bone-dust ought to be eaten off by sheep; for, without such assistance from other manure, we conceive the bone-dust would have too much to do of itself in supporting all the crops during the rotation. This being the notion in Scotland, the practice originating from it is, that never more than sixteen bushels generally, though some farmers apply 20 bushels, is applied to the imperial acre. We have also a notion in Scotland that bone-dust has a caustic quality, and that considerably more than sixteen bushels to the acre on light soils, would do more harm than good. We have ourselves experimentally tried the effects of different quantities of bone-dust in raising turnips on light gravelly soil from twelve to twenty-five bushels per imperial acre, and found the crop improved decidedly to sixteen bushels, but not in the least beyond that quantity. So far, therefore, as the turnip crop was concerned, any quantity above the sixteen bushels was thrown away. The circumstance, as expressed in the statement, that farm-yard manure yielded more barley on the "sand-land" than bone-manure, after the land had been previously boned, shows analogically the fertilizing effects of feeding sheep at turnips on land that had been manured with bones. Until, therefore, we learn that turnips had been raised on the "sand-land" with only sixteen bu-

shels per acre; that at least, the half of them had been eaten off the ground by sheep; and that the grass after the barley had been pastured at least two years, we are more disposed to ascribe the failure of the grasses to the system of farming described by the duke, as being quite inapplicable to such soil, than to injurious effects from the bone-dust.

From the Franklin Farmer.

HARVESTING OF CORN.

To the Editor—As the season is approaching in which the farmers will commence the securing the abundant crop of corn with which a bountiful Providence has blessed our country, it may be pertinent to the occasion to offer a few remarks upon the best mode of harvesting the crop.

Our Virginia ancestors and those who think it wise to plant and cultivate and gather as our fathers have done, pursue the old method; about this time they gather the blades below the ears of corn—after they consider the corn to be ripe, they top the stalks and secure all of the fodder in stacks for winter use. In November they pull the corn and remove it to cribs, where it is husked out at leisure. This mode is rapidly yielding in the stock districts to that first introduced among the graziers on the south branch of the Potomac. The farmers in the northern and middle districts of Kentucky, and in the Scioto valley of Ohio, have generally adopted this latter mode; which is to cut the stalks, corn, fodder and all, and place them in shocks commonly embracing sixteen hills square.

I have seen the richest crops of many climates gathered, and there is no operation in husbandry so animating as that of cutting corn in the mode just mentioned. It is a most cheering prospect to see twenty acres of corn pass in one or two days to a condition in which it is prepared to keep in the field throughout the winter. This remark is predicated particularly upon the plan of riddling the squares, instead of cutting the whole square at once. It will readily occur to any observing mind, that as corn does not ripen with precise regularity, if the entire square is cut out at once, some of the corn will mould and sometimes even the fodder will be affected, if the cutting shall be followed by warm or wet weather. To avoid this contingency, some graziers commence with the process of riddling, that is, they select only such part of the sixteen hills square as may be ripe—go through the field in this way, and in ten days complete the cutting of the square. By this process several important advantages are obtained—the greatest amount of fodder is secured, consistently with the paramount object of saving the corn, and a nucleus for the shock being formed by the first cutting in the square, the shock becomes settled and stands better during the winter. In the rich counties of Clark and Bourbon, they sometimes cut half of the square on one side and then in ten days finish it. Whilst many graziers in Fayette, Lincoln and Shelby, prefer the process of riddling.

In the course of October and November, these shocks are shucked out, the corn placed in cribs and two of the shocks placed together, or one placed upon the ground and two others put around it.

It is the opinion of practical farmers, that the practice of cutting corn in this mode secures the greatest amount of corn and fodder with the least expense, and is decidedly an improvement on the old Virginia plan, more especially when applied to the feeding of cattle or mules.

THE ADVANTAGE OF "SWATHING" WHEAT, IN REAPING, INSTEAD OF "HANDING."

To the Editor of the Farmers' Register.

This year the luxuriant growth of my wheat induced me to think that it could not be saved by the long scythe and cradle, and handled by the binders, in the usual way, to advantage. I reduced my scythes and cradles to forty-eight inches, and swathed my wheat. Being satisfied, from observation, that this method of saving my wheat is greatly to be preferred to the one I formerly pursued, I will state the manner in which the work was done; and if you or your readers should esteem this hobby-riding, I am quite willing you should indulge the laugh. I do not think, according to your definition, you can bring it within the class of humbugs. As I understand you, hobbies generally bring loss to the owners; humbugs are started by the jockeys for profit.

The stroke of the cradler brings him half round on the land, and, by raising the heel of the cradle, he lays the wheat across it; his hands both remain firm on the sneed, the weight of the wheat rests upon him, but for a moment. The motions being freer than when he gathers by the hand, he cuts faster, and with more ease to himself. My people disliked the change at first, but soon became accustomed to it. I had two or three lands cut before the rakers and binders started. Four rakers (the rakers collecting two lands) and seven binders kept without difficulty the distance at which they started, and would have overtaken the cradlers, if I had permitted, and sometimes, in my absence, did so. The task of rakers is easy; by a little care they collect all the wheat which is cut off, and by gathering it in bunches of a proper size, the binder has to make but one stoop for a sheaf, and there are no scattered heads to be collected by hand, which greatly lessens and lightens his labor. My crop was unusually heavy; but I never gathered wheat at so little loss. My usual practice has been to run a horse-rake after the binders; but so little was left this time, that I deemed it not worth the cost. The experience of the harvest has convinced me, that by this method, unless the wheat is much down, it can be better saved than by the sickle.

In New York and Pennsylvania, swathing is the usual method of gathering wheat; but I never before saw it in Maryland. If it be the common practice in Virginia, it would be useless to give this a place in the Register. To communicate to farmers what they know, is in as bad taste, as to tell to a company a good story which they had heard before. Among the complaints made by Sir John Falstaff against Justice Shallow, one was, that he was ever on the rearward of the fashion, and sung old tunes which carmen whistled. I have no inclination to be numbered in the family

of the Shallows, though the connexion is pretty numerous, and some of them wear fine linen, and sit in high places.

Mr. Hussey, the patentee, had his wheat-cutter in this neighborhood during the harvest, which did its work perfectly. I saw the performance, and do not think it left one head in a thousand. The only objection (which is a serious one) is, that it does not do enough. I understand that from fifteen to eighteen acres is as much as it can cut in a day; and you well know that a protracted harvest is often attended with serious loss.

RUSTICUS.

Eastern Shore, Md. July 28, 1838.

[The general practice in lower Virginia, is to catch the reaped wheat from the cradle in the left hand, and then to throw it, (two or more such handfuls together,) to be picked up by the binders. This usage could not have been commenced, except where the growth was light and thin; and nothing but the difficulty of changing the old practices of laborers, has prevented this mode being abandoned, on good lands, for that recommended by our correspondent.—ED. FAR. REG.]

From the Cultivator.

AGRICULTURE IN FRANCE.

There are at present in France 123 agricultural societies, and 303 agricultural committees, where, before 1803, there were scarcely ten, and they are constantly increasing. Every thing has been done by the present government to encourage agriculture in a pecuniary way, as well as by the different societies. The sum of 500,000 francs—nearly 100,000 dollars—has been placed at the disposal of the French minister of public works, for the encouragement of agriculture during the year 1838. There have been also several gentlemen travelling in Scotland, at the expense of the French Society of Agriculture, in order to examine the system of farming in that country.

From the Cultivator.

A HINT TO CATTLE BREEDERS.

T. A. Knight, the very distinguished horticulturist, publishes in the Farmers' Magazine, a communication on the ill effects of overfeeding young stock. Young cattle thus brought up, when taken into other districts, have been found, with their offspring, incapable of thriving upon common pastures. Animals, he thinks, which have been overfed from their birth, and whose ancestry have been subjected to the same treatment, acquire a power of eating and digesting a much larger portion of food than others. He admits that the improved Durhams are brought to market at a very early age, oxen of very great weight and excellence; yet he says it is well known that all those young animals come to market deeply insolvent, the sums for which they are sold being greatly less than those expended in feeding them. In illustration of their expensive keep, he cites the following facts:

"Three Herefords and three Durhams," says he, "were put into stalls, to be fatted on the third of November. The weight of the Herefords was then 33 cwt. and that of the Durhams 38 cwt. and 14 lbs. Between that period and the 30th March, when all were sold in Smithfield, the Durhams consumed 12,755 lbs. weight more of turnips, and 1,714 more pounds of hay, than the Hereford; but the Durhams, notwithstanding the larger size when put to fatten, and the greatly larger quantity of food consumed, sold for only twenty shillings more than the Herefords; and such I believe will ever be the result of similar trials, when one class of animals has been properly fed, and the other overfed, the merits of the breed being equal."

This reasoning is true in regard to perennial vegetables—trees for instance. If the nursery from which they are drawn, and in which they have been raised, is very rich, they will not thrive so well in a common soil, as those which are taken from a soil of an inferior quality. If the habit of gormandizing is established when the plant or animal is young, neither will thrive so well afterwards upon spare food, as if they have been brought upon more moderate fare.

From the Quarterly Journal of Agriculture.

EXTENDED USE OF MACHINES FOR SOWING GRAIN.

The extended use of sowing-machines, both drill and broadcast, will most probably supersede in a short time the practice of sowing grain by the hand. We own we should not like the idea of abandoning this ancient practice, though for nothing else than for the many pleasant associations by which it is endeared to every lover of field labor. These associations can never be recalled whilst using any sort of machine. Hand-sowing is also an accomplishment, and confers a superiority on the possessor. The season of the year in which it is most usually practised, inspiring the mind with the lively hope of a manifold produce; the measured step marking the time, and reminding of the progress of the work; the simultaneous action of the limbs, inducing the regular exercise of the muscular frame; the steady eye directing the flight of corn with a rainbow-like sweep to its destined place in the earth: all these tend to interest the sower in the continuance of the operation. Sowing by the hand, too, is a quick operation, one man keeping two pairs of horses, two men, and a woman in constant occupation. In this respect it is doubtful that machine is cheaper than hand sowing. It is, however, a difficult art, and can only be exactly performed after much practice; and as a proof of the difficulty of its acquirement, there are many men who never become neat, expert, and safe sowers all their lives. Being thus a difficult operation to acquire, and at all times performed with much labor, machine-labor will no doubt supersede it on all large farms, and, indeed, on all farms on which the grass-seed sowing-machine is used. The precision and beauty with which the broadcast sowing-machine distributes the grass-seeds on the ground, in all states of dry weather, in comparison with the hand, and the easy adaptation of that machine to the sowing of corn, has already substituted it for the hand on many farms. The quantity of seed to be sown can be regulated with much greater precision by any machine than

by the hand. Besides, the broadcast-machine, the drill-machine, we perceive, is now much in use on the borders, particularly in sowing wheat. There are various sizes of those drills, but all are formed for the same purpose, and on the same principles. Their object is to deposit the seed at a given depth in the soil, and cover it up so as to require little harrowing afterwards. There is a practice of drill-sowing in Cumberland and Dumfriesshire, which deserves imitation in other districts. A person brings a large Suffolk drill from Suffolk, and undertakes to sow the autumnal wheat with it, at 2s. per acre. This is a very efficient implement, and as it costs £40 when new, employing it in this manner seems a very good plan of getting the wheat seed sown. The annual interest and tear and wear attending the ownership of this drill, would be equivalent to the sowing of twenty-four acres of wheat land. It is generally believed that drill-sowing saves seed. Whether the saving is an object, appears doubtful from the following statements of Lord Western, in a letter to Lord Rayleigh, dated from Felix Hall, in last March. He addresses his lordship to inform him "of the result of a mode of wheat sowing, which differs from the practice of this neighborhood, and which I have tried eight or ten years with great success, and the advantages of which are peculiarly striking this year, when the failures of plants are so prevalent. Any person now may have ocular proof of it. I can show them 100 acres of wheat, upon every acre of which I have a sufficient plant—I may say a full and thriving plant upon 90 of the 100. It is a nice question at all times to determine cause and effect, but I have no doubt in this case that the superiority of my wheat plant to most of my neighbors this year (which will generally be admitted by them) is owing entirely to my mode of putting the wheat into the ground. I use the drill in rows, nine inches apart, and put in at least three bushels per acre. I adopted the plan in consequence of what I saw at Holkham about eight or nine years ago, and from the strenuous advice of my friend the Earl of Leicester, and the example of himself and several of his very intelligent and experienced farmers, who joined him in urging me to this course. One old farmer, who occupied a very large farm under him, told me he had uniformly pursued that system above fifty years with the greatest success; he was of opinion that the quantity of seed was generally too small (of course the quantity should vary according to circumstances,) but he was satisfied an increase of seed would increase the growth of the country most essentially. Since that time I have sown all my wheat in this manner, and I have had great crops, I may say quite equal to the best farmers around me. I by no means ascribe these large crops of wheat exclusively to this drill system, because the seasons have been so good, and I have farmed high. I confidently believe, however, that something is due to the system, and that this year has shown that great advantages are derivable from it in seasons, and under circumstances that are unfavorable for the preservation of a good plant—the first object of every practical farmer, particularly on heavy land, whereon are so many failures. The general objection to the plan is, that the wheat will be thick in the rows, that it will grow up without tillowing, and with many short ears. I do not, on experience, find this objection well founded. I think the number of short ears to be found in this mode is not greater than in the wheat that has more room to tillow, and they are generally filled with good corn, full-sized grains. I hardly have heard any other objection made, and the advantages of the thick plant are many, some rather peculiar to this country. One considerable difficulty we have to encounter in our clay-bottom lands arises from the tardiness of our early vegetation, which renders our early plants comparatively a more easy prey to vermin of every sort, such as the slug, the worm, &c. and bad ungenial weather. Where there are any rabbits, destruction will often ensue in these lands from the weakness of growth in the plant, which would be overcome in warmer and quicker vegetating grounds. This remark of course does not apply to gravel-bottom lands, which are to be found in some few and limited districts. Now, it will be admitted generally, that where the plant is thick, it will grow considerably quicker upon first coming out of the ground—the numerous blades seem to protect and keep each other warm; and the roots partly matted together, get a better hold of the ground, so that they are not loosened by the biting off the blade, nor are they so loosened by succession of frost and thaw; they are by no means so likely to be root-fallen, which is productive always of the worst consequences when it occurs, and the mischiefs of which are peculiarly striking in many instances this year. I can drill with the heavy Suffolk drill, covering ten feet or twelve furrows at a time; nearly if not quite as straight as is practised in the light land of Norfolk and Suffolk."

We were glad to observe the prevalence of ribbing with the small plough the seed-furrow for spring wheat or barley on a winter ploughed furrow. There is no better mode of obtaining a fine mould, a good depth of bed for the seed, and of avoiding the bringing up of a raw clod which the ordinary plough would inevitably do in a late or damp season, and of dispensing with much harrowing. This ribbing is applicable to all soils, and particularly to those which are apt to throw out in severe frosts and bright sunshine in spring.

From the New England Farmer.

NOTICE OF THE CHINESE TREATISE ON SILK CULTURE.

[The following article, from a late English publication, relates to the curious old Chinese treatise, of which a translation has recently been published, and from which an extract was republished in the 4th number of this volume. These remarks will not be uninteresting to those who have read that extract; and may induce others, who have passed it over, to return to it, and give it due attention.—Ed. Far. Reg.]

Not very many years have elapsed since the project of introducing the silkworm into this country was seriously taken up by several scientific persons; and the probability of its becoming eventually a source of wealth was warmly discussed. Gradually, however, the ardor of these projectors

was found to cool, and the matter fell to the ground; and was soon as little spoken of, as if an enterprise had been meditated which sensible men ought to disavow. Notwithstanding this implied reflection on the good sense of the supporters of the plan, a few gentlemen shortly after might be found scattered through England, who still cherished the conviction that the introduction of this insect was perfectly feasible. They planted mulberry trees and bred silkworms as an innocent source of amusement; and to this day they continue to occupy their spare time in trying experiments on a limited scale, on the best modes of bringing up their favorites; but if the project was eagerly received here, in Ireland it was hailed with enthusiasm as a certain mode of realizing a fortune. The ardent imagination of the Irish easily overleaped the barriers which inexperience or want of capital threw in the way; and for any one not to have implicit faith in the silkworm speculation, was looked on as a mark of meanness of spirit, or of total disregard to personal advancement. A joint-stock company was even proposed, and a vast number of names were marked down for shares; but when the day of paying the first instalment came round, the absentees were found to be so abundant, "that the company dissolved itself," as a wag afterwards remarked, "even before it was formed." The zeal of individuals was but little manifested in mulberry plantations or silkworm nurseries. One person only showed that he had been perfectly serious in his enthusiastic advocacy of the enterprise; he planted some thousands of the trees, and when we passed through some dozen or fifteen years ago, we saw the plantations in a most flourishing condition. The Earl of Kingston it was who had given this proof of his being serious in the silkworm project; and even to the last, we believe he spoke with every appearance of being thoroughly persuaded of the possibility of the plan. Both in this country and in Ireland, the great objection was that the climate was too severe for so delicate an insect as the silkworm. The slightest variations of cold and heat were known to affect it; and sudden changes were frequently found to cause its destruction; modern discoveries have proved this notion to be hastily assumed, and perfectly erroneous. The insect is now known to be capable, with proper management and due precaution, of supporting our climate; and it is with the intention of showing the truth of this important fact to our readers, that we have determined to lay before them some valuable information which has but lately come to light.

The source from which we derive this information, is a treatise by the Chinese themselves, which has been lately translated and given to the public in France. When we consider the acknowledged advancement of the Chinese in the arts and sciences, evidenced by their knowledge of printing—of the mariner's compass—of gunpowder, and many other curious discoveries, long before the inhabitants of Europe, it is a matter of wonder that their literature has not been more carefully studied, and the results of such studies made public. All that we have until lately known of the Chinese, and their habits, manners, customs, and knowledge, has come at first through the early missionaries, and next through the embassies sent over from this country. A third spring of information has now been opened; and we are not over sanguine, in predicting that a most important stream of curious knowledge will be found to flow from it. Should it be asked, how it happens that this particular juncture has had the merit of making public the contents of the Chinese work, we answer, that it is the same cause which, in the days of Perseus, caused the Roman parrots, when hungry, to salute their mistresses in the Greek words they had been taught, namely, self-interest, a most prolific source of research and invention. Thus it was that the work was translated.

The production of silk, at the present day, in France, amounts to a value of more than 60,000,000 francs a year; which is, however, quite insufficient for the consumption, as the foreign trade alone reaches 50,000,000 francs a year. Silk is one of the principal products of China: for not only is it used to a great extent in the fabrication of their clothes, but a vast quantity is exported in the raw state, as well as in the shape of fabricated articles. For forty centuries have they devoted their attention to study, in its minutest details, the rearing of the worm which furnishes them with this source of their national wealth; and as a natural consequence, this long experience, always stimulated by the sense of self-interest, has caused them to discover a crowd of attentions, of proceedings, and of practices, most likely to procure for them certain and advantageous produce.

The missionaries were at once struck with the importance of these practices to the European cultivator of the silkworm; and they determined to mark down some of their modes of treatment, for the benefit of their countrymen. Two treatises were drawn up, and afterwards published in France. One of them, by Father d'Entrecolles, gives the extract of an old Chinese work respecting the treatment of silkworms; and the other, composed by Father d'Incarville (or rather, from notes left by him,) describes the treatment given to three other species of worms, which the natives designate "wild silkworms," because their nature requires that they should be permitted to live at full liberty on the trees from whence they take their food. Some of the methods of treatment described by d'Entrecolles, were not long ago put in practice by M. Camille Beauvais, a large breeder of silkworms at Senart. He found them to be most serviceable, and most certain and faithful in their results; but above all, he found that the adoption of the Chinese treatment was of wonderful efficiency in preventing accidents, which before had dreadfully puzzled and annoyed him.

As the abridgment of a work is always incomplete in details, M. Beauvais thought that it would be important to have the original Chinese work translated. He applied to the Minister of Commerce on the subject, and laid before him the importance of the case. M. Passy was at that time minister; and he applied, in his turn, to M. Stanislas Julien, as the first Chinese scholar in France, or perhaps in Europe. He directed this eminent *savant* to undertake the task; and M. Martin (du Nord,) who succeeded to the ministry of commerce, made the work complete, by desiring M. Julien also to translate the Chinese work on the culture of the mulberry tree, which is always annexed to the work on the treatment of silkworms. M. Julien undertook this arduous task; and has

just given to the public a translation of the two treatises, of rare precision and clearness. To this has been added, Father d'Incarville's treatise on the wild silkworms; and the whole has been published at the royal printing office. The French scientific men speak of the work as containing a vast quantity of useful details; and they declare that it will be the means of greatly increasing the wealth of France. Without going the whole length of their sanguine anticipations, we can see that the information thus given is highly important, and that it may be of great value to this country as well as to France. One peculiarity of the work is, that the Chinese have followed no fixed plan; there is no succession of ideas in natural logical order in the Chinese writings. Down they put whatever thought occurs to them; satisfied apparently, like the sibyl of old, with having marked it down, but totally regardless of its fate afterwards. It might be a curious question to discuss the reason of this want of order; whether it arose from habit, or from some defect of organization: this, however, is beside our present purpose; we only desire to speak of the works before us. In considering them, it will not be found an easy task to place all in proper order. The little treatise by Father d'Entrecolles will be found of use as a sort of guide; but as it may not be practicable to obtain this work, we purpose culling from the translations some of the facts which strike us as useful and singular.

The silkworm, when it has just burst into life, is at first a little black caterpillar, about the length and thickness of an ant. In this state, its growth is so rapid, that after twenty-five or thirty days it has arrived at a size some hundreds of times more considerable. It then spins its cocoon, and is transformed into the chrysalid form; it emerges from thence a gay butterfly, engages in the work of generation, lays its eggs, and dies. The care of the Chinese follows the insect in all the phases of its short existence, without losing sight of it a single instant. The rapidity of its development as caterpillar, requires that it should several times get rid of its skin, and replace it by a larger covering. Every one of these changes constitutes a perilous crisis in the insect's existence; because it then remains without movement, and as if benumbed, during the period that nature urges on her handiwork.

It is easy to conceive, that the temperature, the food, and treatment, ought to be different for the insect when approaching its state of torpidity, from those which are most beneficial to it when in its time of health and vigor. The first and grand provision, therefore, for successfully rearing a season's insects, ought to be, to obtain a collection which, born at the same time, and under the same circumstances, shall be endowed with constitutions of like vigor, in order that the changes of their activity, of their torpidity, and of their final transformation, shall arrive simultaneously or nearly so. It is almost impossible to picture to one's self the multitude of cares which the Chinese devote to this fundamental condition. They commence their attention in the very choice of the butterflies destined to produce the eggs, rejecting such members of the two sexes as are born amongst the first or the last, and making use only of the intermediate ones; and even using their discretion in putting together, for the work of generation, those insects which their experience shows them are best suited to each other. Next the eggs become the objects of their solicitude. Here also they cast away the first and the last which are produced; and they pay great attention to having the batch equally distributed over the paper on which they contrive that the laying should take place. They thus avoid all heaping of the eggs, which would, when the hatching was concluded, place the insects in unequal circumstances; or if the eggs should, notwithstanding their precautions, be heaped on each other, they reject the mass altogether as intelligible for their purpose. Afterwards, they preserve these eggs with a thousand precautions, causing them to undergo various washings and other preparations, before the moment when the insect is about to burst into life.

So great is their ability in managing the education (if we may so term it) of the silkworm, that they generally contrive that all the insects should come from the eggs in the same day. Here again they reject the precocious and the tardy ones, in order to retain and bring up only those of the middle class. Having procured the fulfilment of this principle of original simultaneousness, they make every exertion to maintain all the phases attendant on the insect's existence. The cleverness of the Chinese is such, as to enable them to reduce the period of these changes, at most, to twenty-five, or even twenty-three days: whilst our unskilfulness obliges us to prolong the period to thirty or thirty-five days, to the serious detriment of the silk produced; for the Chinese have ascertained this important fact to be true, that the quantity of silk produced by the worm, is less in proportion to the length of time that it remains in the caterpillar form—the longer it remains, the less is the produce; and the rapidity of the reduction is enormous. To make this position clear, let us suppose that a number of worms, which have been developed in twenty-five days, have given twenty-five ounces of silk; if they remain, through any want of nourishment or necessary care, in the catterpillar state for twenty-eight days, the amount of the silk produced will not be more than twenty ounces: and should they delay to the thirtieth day, not more than ten ounces will be given. This is not only a very curious fact, but of great importance in a commercial point of view, and well worthy our serious attention. The Chinese have been long aware of it; and hence they deem no care too great which will hasten the birth of the insect. We must also look with admiration on the minute and delicate attentions with which they regulate the insect throughout. They are particularly cautious never to detach the eggs from the papers on which they have been deposited, to place them in heaps, as is so unreasonably practised in France, but they leave them their separate station and their hold on the surface, both which are found to be favorable to a speedy hatching. They also take care never to handle, or even to touch with the end of a pair of pincers, the little worms when they are born, in order to place them on the mulberry leaves: they would fear to run a risk of tainting them. How different is the practice in Europe, where it is quite a matter of daily occurrence to detach the eggs from the paper and place them in heaps: afterwards they are tied up in linen and transported

to a distance. May not this be the cause of those frequent malformations which appear in the European silk nurseries, and which occasion such tremendous losses afterwards? a circumstance, be it observed, never seen amongst the Chinese. Their practice is, to gently place on the leaves the papers on which the worms have come into existence, in order that they may of themselves descend and take their food; nor do they place within their reach entire leaves at first, but little morsels, cut very neatly and scattered through a small sieve, in order that they may be distributed uniformly and in proportion to the number and the age of the worms. The quantity given at each repast is exceedingly small; and the increase is made in the number of repasts, but never in the mass of food given at each. The practice, we may remark, is founded on just principles; and the proofs of its efficiency are seen every day in our farms in this country, where cattle are found to thrive best on small and frequent repasts; not only because such are most easy of digestion, but because the animals eat more eagerly, and with a better relish, their food, when fresh, than trampled on, or tainted by their breath, when given in large quantities.

It would be an endless task to follow the Chinese through all their minute details, the influence of which, however, must be exceedingly great on the silk produced. Their treatment of the cocoons —their proceedings with regard to their silk crop; and their mode of winding the thread, are exceedingly curious. Our limits will not permit us to delay much longer; we shall, therefore, only add an interesting fact or two before we close. The Chinese use two sorts of artificial food for their silkworm; one of these is a leaf of a tree called *tche*, and a plant which bears the title of *Ouo-kin:* these are employed when the mulberry tree has not yet pushed forth its leaves, or when there is a scarcity of them. What these two productions are we have no means of ascertaining; that they are used throughout China for silkworms is certain, for mention is made of them in an old Chinese almanac, apparently intended for the working classes. The *tche* tree is also noticed by d'Entrecolles, who describes it as a prickly tree, which grew on exposed and lofty situations, and had a fruit like pepper. In the work translated by M. Julien, a rude sketch is given of the tree; but so vague is the outline, that we are unable to assign it to any particular class. The same incertitude exists as to the *Ouo-kin*. Remusat identified it with the wild chicorry; while in the *Amœnitates Exoticæ* of Kœmpler, it is suggested that it resembles our lettuce; it surely will be worth while to try both plants, and judge by the manner in which the silkworms receive them. The Chinese also employ, in feeding the worms, mulberry leaves gathered towards the end of the preceding season; these they dry and reduce to powder; and having lightly sprinkled the fresh leaves, they scatter it gently over them. The worms are always found eager to feed on it; and one advantage of it is, that it can be used at all times. Rice is also found to answer. It is first husked and then boiled by steam; this is then ground, and the flour is given to the worms. A small sort of pea, after being first allowed to germinate a little, is also employed; and all these preparations are said to render the silk stronger and more abundant. All these expedients are favorable to the introduction of the silkworm into England; which the Chinese mode of treatment proves to be perfectly practicable.

The long experience of the Chinese has made them aware of the fact, that the artificial education of silkworms requires a succession of different temperatures, suited to the different changes of their existence; and that, at the same time, the air which they inhale ought to be constantly purified of their perspiration, their evacuation and the bed of leaves on which they are placed. To effect this, they have found it necessary to erect close buildings, where an artificial increase or diminution of heat can be given when required, and where fresh air is constantly admitted. They have also discovered that these transitions of temperature must be almost insensible; and all their skill and ingenuity are taxed to accomplish this desirable object.

The Chinese author enters into a most minute description of the structure, materials, and situation of a silkworm nursery. He gives an account of the mode of heating it; and, at great length, details the form and use of the different instruments and utensils required in the concern. We do not intend following him in these details, curious as they certainly are; we shall only mention one circumstance connected with the heating of the nursery, which will show to what extent their cares are given. In addition to their scientific modes of maintaining the exact temperature beneficial to the worms, they employ what they deem the best indicator of a proper equilibrium, and even superior to a thermometer—this is the woman who takes care of the worms, and who is called their *mother*. This personage is clad in a single thin vestment, in order that her sensibility to cold or heat may be constantly awakened. These women are considered persons of importance; and whether from organization or habit, can at once detect the slightest change of temperature.

It is owing to this judicious use of air and light, (which we should have mentioned is particularly dwelt on,) that the Chinese are quite ignorant of those dreadful epidemics caused by mould, which in France makes its appearance on the bodies of the worms, in even the best regulated nurseries. In Italy also it is a matter of notoriety, that a vast quantity of worms perish every year from a similar disease; it is to be hoped, that from the present time the evil will be materially diminished. The best plan of a nursery yet tried in France, is one designed and erected by M. Darcet for M. Beauvais, of whom we have already spoken. This plan is considered, by some cultivators of silkworms, as most efficient; while others declare that it is little superior to a common workshop. The Chinese treatise shows that in many respects it is founded on wrong principles; and we may soon expect to hear that some modifications in its structure have taken place.

From what we have stated of the contents of the Chinese treatise, it may be seen that the cultivation of the silkworm is perfectly easy in this country. The difference of climate has been deemed by some scientific men as an insuperable bar; but this objection is taken away by the work which establishes the fact, that the greatest produce of silk in China takes place in the central

provinces, lying between 25° and 35° of north latitude. Thermometrical observations have also proved that the mean temperature of the northern and southern provinces of China differs but little from that of Provence in France, the winters being somewhat more severe, and the summers a little hotter. The work also shows, that the cultivation of the silkworm was carried on to an enormous extent in the most northern provinces of of China, and we have no reason to suppose that the cultivation has been discontinued. Nor is it at all necessary that these silkworms should be reared in vast quantities or in large buildings; if this was necessary, how could the Chinese peasants pay their taxes, which are generally given in silk? The population of the country being exceedingly great, the land has been for ages divided into very small holdings; indeed, to this cause only can we attribute the declaration of Barrow and other travellers, that the appearance of the country is rather that of a vast collection of gardens, than that of an agricultural district. The philosopher Meng-Tsu, who lived in the fourth century before the Christain era, says, "that of the portion of land allotted to each family, it is sufficient to plant the twentieth part with mulberry trees, to enable the family to clothe themselves;" and since then, the tax imposed on each peasant's family is generally paid by a certain number of bushels of grain, a fixed quantity of silk stuffs, and some ounces of silk thread. This proves incontestably that each family rears worms to clothe themselves, as they cultivate the fields with their hands to feed themselves. Hence we may reasonably infer, that the methods prescribed in the Chinese treatise are equally applicable to private nurseries on a small scale; indeed, we might go much further and say, that the great establishments are exceptions, rather than the cottage of the husbandman; for as the work was drawn up for the general instruction of the nation, can we suppose that the writers had not in view the circumstances and condition of those for whom the work was intended? And as the vast majority of the inhabitants are of moderate means, ought we not to believe that the work was chiefly written for them, rather than for rich capitalists possessing large establishments?

We feel convinced that this branch of industry can easily be introduced into this country; and we do not deem the day far distant, when it will prove a source of wealth to thousands. Should our remarks lead to this desirable result, it will certainly be a source of great gratification to us; should we fail to excite public interest, we shall still have the consolation of thinking that we have faithfully discharged our duty.

CHINESE OPINIONS AND PRACTICES IN MULBERRY CULTURE.

[The few short extracts which follow, are from the Chinese work referred to in the foregoing article. In the enumeration and description of the various kinds of mulberry tree, it will be perceived that not one resembles the *morus multicaulis*, commonly called the Chinese mulberry.—Ed. Far. Reg.]

Different kinds of mulberry trees.

1st. The small mulberry trees (dwarf trees) have long branches, called *niu-sang* (ladies' mulberry trees) and *i-sang*. [*Eul-ya* Dictionary.]

2d. The *yen-sang* or *chan-sang* is the wild mulberry tree, the mountain tree. [Same work.]

3d. The *tseu-sang* or seed mulberry tree; its fruit shoots out before its leaves. [Japanese Encyclopedia, book LXXXIV, fol. 1.]

4th. The mulberry tree called *khi-sang* (that is to say, chicken mulberries) have leaves veined with red; they are rather thick. The silk worms that are fed on them produce a thin cocoon, which furnishes little silk. [*Tchong-chou-chou.*]

5th. The white mulberry tree bears thick leaves, that are as large as any one's hand. The cocoons of the worms that are fed on them, enclose a strong and abundant silk. This leaf furnishes twice as much silk as that of the ordinary mulberry tree. [Ibidem.]

6th. The mulberry tree, of which the leaves are plaited, and covered with a yellow pellicle, is called *kin-sang*, or the gilded mulberry tree. All the silkworms cannot be fed on the leaves of this tree, of which the color foretells that the tree will soon dry and perish. [Ibidem.]

There are some mulberry trees that do not produce fruit; they are vulgarly called *nan-sang* or male mulberry trees. [Japanese Encyclopedia.] The mulberry trees, of which the fruit sprouts out before the leaves, necessarily bears very few leaves. [*Tchong-chou-chou.*]

—

To sow mulberries, the fruit of the black mulberry tree of *Lou* must be taken. The yellow mulberry trees of the country of *Lou* cannot be preserved a long time. [*Thsi-min-yao-chou.*]

—

The mulberry trees of the country of *Khing* (ancient name of the province of *Hou-kouang*) and of the country of *Lou*, may be planted in level plains, where the ground is limey and clayey, and also in light earth. If the ground touches a mountain or hill, that is hard and mixed with red veins, it is only suitable for the mulberry trees of the country of *Khing*. [*Nong-sang-yao-tchi.*]

—

The different kinds of mulberry trees are very numerous, we cannot describe them all.

The best are those of the country of *Lou*, and of the country of *Khing*. The mulberry trees of *Khing* yield a great quantity of fruit, but those of *Lou* very little. Those of which the leaves are thin, pointed, and divided in lobes, are the trees of the country of *Khing*. They bear solid and hard leaves.

The mulberry trees of the country of *Lou* have round, thick, and juicy leaves.

The mulberry trees of which the branches and leaves are large, and thick, are a species of those of *Lou*.

The mulberry trees of *Khing* have solid roots and full hearts; they last for a long time. Those are the kind to be planted.

The mulberry trees of *Lou* have less solid roots, and hearts not so full; they cannot last for any length of time, (dwarf mulberry trees.) Trees called *ti-sang* are formed from them; but the trees of *Khing* have neither as many branches, nor as

many leaves, as those of *Lou*. Branches of the mulberry tree of *Lou* may be grafted upon them; they then live for a long time, and yield an abundance of leaves.

If the mulberry trees of *Lou* be employed to obtain the species of tree called *ti-sang*, (dwarf trees) and if they be reproduced by twigs, they propagate without interruption, and last an infinite time.

The silkworms that are fed with the leaves of the mulberry trees of *Khing*, produce a firm and strong silk; it is fit to make *cha* and *lo-cha*, (kinds of thick gauze and crape.)

The leaves of the mulberry trees of *Lou* agree with the worms that are large; those of the trees of *Khing* with the small worms. [*Nong-sang-thong-khioue.*]

—

Propagation of mulberry trees.

The work entitled *Thsi-min-yao-chou*, describes the manner of obtaining the best seed of the black mulberry trees.

The two ends of the mulberry must be cut off with a pair of scissors, and only the middle part taken. The seed of the two extremities are comparatively smaller than the others, and if sown they produce little mulberry trees, called *khi-sang*, (chicken mulberry trees) and *hoa-sang*, (flowering mulberry trees.)

—

The intermedial part of the mulberry has larger and harder seed. The trees that proceed from them have firmer and stronger branches, and they bear thick and nourishing leaves. [*Nong-sang-thong-khioué.*]

—

The mulberry trees called *ti-sang* (dwarf trees) ought to be planted in a garden near a well. If grass springs up around the roots of the trees, the earth must be turned up with a spade. When it does not rain they must be watered. When the silkworms are hatched they ought to be watered three times a-day; the leaves will then grow very quickly.

Among the different kinds of mulberry trees there are some that sprout out early, others late. It is from among the mulberry trees which are in leaf the earliest, that those are chosen, from which the trees called *ti-sang*, or dwarf mulberry trees, are formed. [*Nong-tching-tsiouen-chou.*]

—

In the work, entitled *Tchong-hoa-min*, it is read: There are two kinds of mulberry trees: one bears the fruit of which we sow the seed: it sprouts out in the first or second month, (February or March.)

The following is the manner the other kind is multiplied:

A pliant branch is bent to the ground, and maintained in that position by a clod of clay. Each bud produces a branch. When this mulberry tree has attained the height of two or three feet, its roots are then formed. The mother branch to which it belongs is then cut, and it is transplanted in another place. It soon becomes a tree. [Same work.]

* * * * * * *

Observations upon the choice of mulberry plants.

The mulberry with a wrinkled bark yields only small and thin leaves; those of which the bark is white, the joints long, and have large buds, are the leafy trees of *Chi*, (diospyros; they always bear large and thick leaves. The cocoons spun by worms fed on them are firm, and furnish a great deal of silk.

The tall white mulberries succeed well upon the declivity of hills, in the angle of a wall, or by the side of a hedge.

The mulberry trees of less height, with a black bark, should be planted in moist ground. [Same work.]

The mulberry trees with black bark, which produce no seed, when the leaves are not too thick, are good for the nourishment of newly hatched silkworms. (Same work.)

The trees of the country of *Wang-haï*, are multiplied in the same manner as those with the white bark. The tree called *thsé-teng-sang* (or mulberry tree with rose-like branches) grows high and strong.

The white mulberry tree, or the tree with white bark, yields very little seed, it is multiplied by layers. If a person has seed they can sow it, but it must be in the shade. Heavy well filled cocoons will be formed, which will produce twice as much silk as the ordinary ones. [Same work.]

* * * * * * *

Manner of pruning large mulberry trees.

The branches must be thinned, and above all, pruned in time. It ought to be done in order that the branches may acquire strength and push early, and that the silkworms may not want leaves.

If the branches are cut off, those that remain will acquire strength, and the leaves will become thicker and more nourishing. If this year they are pruned at the proper time, the long branches will become strong and vigorous; the leaves of the next year will shoot out early, and they will be thick and glossy.

All the branches from the centre must be cut, so that a man may stand up and easily make use of the axe. The branches and leaves fall outside of the tree; that is much better, than to be obliged to remove all around the tree a heavy ladder. A man thus placed in the centre of the tree, can do as much work as two persons placed outside of the tree. Too many branches must not be allowed to grow, otherwise they cannot be cut without hard work; moreover, the leaves will be thin and destitute of taste.

Moreover, the art of properly pruning the mulberry trees, is one of the most important points for the raising of silkworms. Many persons do not know how to make beforehand the necessary preparations when the cessation of agricultural work gives them leisure. They only occupy themselves with the mulberry trees, when the season of tending the silkworms has overloaded them with trouble. In this manner they are overcharged with double work, and often the silk worms want necessary nourishment. If, on the contrary, these mulberry trees have been pruned, according to the rules, so that the branches can be easily reached, and the leaves obtained with facility, the silkworms will not wait for their food, the leaves will come in proper time, and, moreover, they will be thick and glossy.

The method used in the country of *Thsin* is called *lo-sang*. In the last month of the year,

(January,) all the superfluous branches must be pruned away, and those that are left be much thinned; afterwards upon the branches that are preserved, four eyes must be left, and the others picked off. The next year the branches that were left will have become strong; the black twigs which will have grown from the middle of the eyes will be three feet in length; the leaves will be twice as thick as usual, and will present a smooth and brilliant surface. During the raising of the silkworms, they can be gathered with the hand; the external branches only, that shoot forth, must be left. After having grown luxuriantly, until the autumn, they will have obtained the length of eight or ten feet. In the last month of the year, (January,) they must be again pruned, as before. After the expiration of several years, if the branches that have been left appear to overload the tree, they must be pruned at their base.

This method is followed in the country of *Loyang*, to the east of the Yellow river; but a different mode is adopted north of this river, in the province of *Chan-tong*.

When the mulberry tree has attained the height of five to seven feet, from the period of its transplantation, the tops of the branches must be cut. As the branches of the centre have been removed, those that remain will grow in a horizontal direction, and extend outward. When the tree has become large and strong, a man can stand up in the centre.

When the tree has attained its *maximum* of strength and growth, the stalk and the branches must be cut in the centre.

There are three kinds of branches that must of necessity be removed.

1st. The branches inclining towards the root;
2d. Those which bend inward, towards the trunk;
3d. Those which grow in pairs; one must be cut;
4th. Those growing in a good direction, but which are too thick and too bushy.

The last month of the year, (January,) is the most favorable for pruning: the month that follows is less so. In the last month of the year the sap is quiescent, and the cessation of labor in the country leaves much leisure to the cultivators. Those persons who prune in the spring, only do it in order to peel them easily, (to make paper,) but that causes the mulberry trees to lose a great quantity of sap.

Those persons who wish to make use of the bark of the mulberry tree can take the branches, cut in the last month, (January,) and deposit them, with a southern exposure, in a hole, covered up with earth. They must be taken out in the second month, (March,) and they then peel very easily. [*Nong-sse-pi-yong.*]

From the Farmer and Gardener.

THE SILK CULTURE IN NEW JERSEY.

To the Editor—I have been spending a few days in the ancient city of Burlington; and as far as my observations and inquiries enable me to form an opinion, I should say that this was the head quarters of the silk culture in the United States. I have visited several places, whose fame in connexion with the advancement of this branch of industry, has been spread far and wide—and I have often been obliged to make diligent inquiries, before I could ascertain, *on the spot*, that any thing was doing at said places. But Burlington does not hide her light under a bushel: she places it on an eminence, so that all may see, and peradventure imitate her good works. You cannot pass along the pavements, without hearing questions asked about silkworms or mulberries: you can scarcely go into a house but you find the inmates engaged in feeding worms. All classes and conditions, from the dignified functionary of the government to the humble occupant of a village lot—rich and poor—publicans and sinners—have caught the contagion: and recently even a periodical—and a most respectable one too—has been established to promote the culture, and disseminate all useful information on the subject. And if you knew the character of the population here, you would say that the good work must succeed. You would be far from thinking it was the ebullition of the moment—a feverish paroxyism—a day dream; which would subside on the slightest abstraction of the stimulus which now supports and sustains it. Such, I take it, is not the character of this people. On the contrary, they are grave, sedate, industrious—not given to violent and momentary excitement—not liable to be entrapped, and inveigled by designing men, into speculative pursuits; but a people thoughtful and reflecting, forming their own judgments upon evidence, and when once formed, pursuing their object with an eye that does not slumber, and a wing that never tires. In this city, a large proportion of the population consists of the descendants of the illustrious Penn—remarkable, you know, for their industry, perseverance and neatness—and by the force of contact and example, these characteristics have been visibly impressed on all the surrounding population.

Gentle reader! who takest an interest in the progress of this interesting pursuit, you might spend a few days here with both profit and pleasure. You will have all your inquiries answered without hesitation. You will find nothing enveloped in mystery. You will see every one willing and anxious to impart all he knows—and finally, I think you will be convinced that the silk culture is no humbug.

POWHATAN.

Burlington, 3d July.

From the Burlington Gazette.

THE MORUS MULTICAULIS.

It is known to the public, a considerable distance round Burlington, that large quantities of this most invaluable tree are now growing in the vicinity of this city. A larger quantity would have been raised the present year, but for the cold wet spell of weather which occurred at the planting season, causing numbers to rot in the ground; this was succeeded by a drought of three weeks' duration, accompanied by intensely hot weather, producing effects decidedly more injurious to the young sprouts, than the cold damp which preceded it. From these causes the crop of trees is very

far short of what was expected. The plants which survived these disasters, are now growing with a luxuriance of foliage that realize to the mind by a single glance of the eye, the sterling value of the multicaulis for the production of silk. It is true that different modes of planting, and a different course of cultivation, have produced different *quantities* as well as different *qualities* of trees, some having succeeded better than others. But from the stock of trees now growing, it is certain that the short supply will be more than compensated by the high prices they will command. There can be no doubt that trees will sell higher the coming fall and spring than they have ever done yet. The character of the multicaulis is now well established in the middle states, from practical acquaintance with it, and it has lived uninjured, in the open fields of Burlington, during the whole of the past winter. As its value becomes better known, the demand for it increases from all parts of the United States. The high bounties on the production of silk which are given by the states of New Jersey and Pennsylvania, have been found sufficient to pay all the expenses of producing the cocoons and of reeling the silk, making the whole produce clear profit. This fact, when added to that of an acre of ground planted with trees two years old, producing a net profit of $300 to $400 per annum, has stimulated the farmers in various sections of the middle states to embark largely in the business of planting trees for the sole purpose of raising silk.

From notices we have read in our exchange papers, of nurseries in various places, an impression appears to exist that all the trees now growing throughout the country are *for sale*. Nothing could be more contrary to the fact; and those persons who expect to make large purchases of trees this fall, will find themselves greatly mistaken. Some growers in our neighborhood could not be induced to sell at *any* reasonable price. We know one instance of a company which intended going into the business last spring, with a stock of 30,000 trees, being compelled to begin with about 5000 only, such was the impossibility of getting trees. Of all the trees now growing, probably but one-third are raised for sale—full two-thirds being grown to feed the worms. So far as the business has progressed in Burlington, it has answered every expectation that was formed of it. Very great profits have been realized from small lots of ground, and there is every prospect of our ancient city becoming the emporium of American silk.

SELECTION OF SEEDS.

The August No. of the Southern Agriculturist contains an editorial general notice of the contents of the July No. of the Farmers' Register, with the kind and approving tone of which we have reason to feel gratified, and find no exception to that feeling in the following comment upon our (alleged) heterodox opinion and the vain attempts to defend that opinion from the attacks of assailants. We have often enough, in these volumes, readily confessed mistaken opinions, to free ourselves from the charge of holding obstinately to any, for the purpose of maintaining a claim to consistency. An agriculturist, more especially than other men, who never changes his opinions on the subjects of his profession, must necessarily remain as ignorant in the end, as his "consistency" would show him to be narrow-minded in the beginning; and one who does not frequently change his views of the relative advantages of practical details, must profit very little by investigation and by experience. It may be supposed, that the farmer or the politician who changes his opinion, is at least wiser than he had been before; and we have never valued the virtue of consistency of opinion so much as to defend our claim to it, if our brother editor had correctly understood and reported either our first declaration, or the alleged "unsaying of it." We shall not here repeat again at length what we have several times stated; but merely refer to all that has been said on this subject, to show, 1st, that we did not in any sense "venture a sweeping condemnation of those who look for profit in the selection of seeds;" and 2d, that we maintain now, as stoutly as before, that the *principle and manner of selection* which were condemned are worthless.

The following is the passage referred to:

"The Editor ventured a sweeping condemnation of those who look for profit in the selection of seed; he is met by one of his correspondents on the question, which it seems has two sides, and the strongest against him. Our unhappy brother finds himself involved in the necessity of unsaying his rash opinion; while he insists upon his consistency as sturdily as a politician who may happen to prefer the reputation of far-sighted wisdom, to a frank confession of mistake. The examples of benefit from the selection of seed, are too numerous and too familiar to daily observation, to leave a doubt that much depends upon it. Sometimes the opinion has been placed in unnecessary contrast, with the acknowledged advantage of an occasional change of seed from one climate or kind of soil to another. Which is productive of the greatest good, is not very easily determined. But there is no very plausible reason why both means of improvement should not be combined. For example, corn very fruitful in ears, or bearing ears of an extraordinary size, may be simultaneously cultivated in situations distant and differing from each other, and mutual exchanges profit both parties."

CAPONS.

To the Editor of the Farmers' Register.

Hanover, August 4, 1838.

Sir—Your last number has just arrived; and I see in it a communication, from some one who signs himself "Rusticus," in regard to capons. He says that he has never seen one in this country, and that every person of his acquaintance, who has attempted to make them, has failed. Now, there are living near me some young men who raise great quantities of fowls, and who, for their amusement, have performed the operation on several young cocks, and have succeeded in every instance but one, and that failure was owing to the bird being too large.

The capons are a good deal larger than a cock, their plumage, I think, much richer; and it is really a beautiful sight, to see half a dozen or so of these fine-looking birds in a flock. They take no notice whatever of the hens, are very cowardly, and have a cluck similar to that of a setting hen.

These gentlemen let me know, about a year ago, the day on which they would make some of them, and I went down, and found the operation a very simple one, and was able to do it myself, after having seen some two or three operations performed. After the next communication of "Civis," if his method does not agree with mine, I will let you have my *modus operandi*.

S. R. M.

From the Farmers' Cabinet.

HOW TO FORM A JUDGMENT OF THE AGE OF A HORSE BY HIS TEETH.

At two years old, the horse sheds the two middle teeth of the under jaw. At three years old, he sheds two other teeth, one on each side of those he shed the year before. At four years old, he sheds the two remaining, or corner teeth. At five years old, the two middle teeth are full, no longer hollow, as all the others are, and the teeth have penetrated the gums. At six years old, the four middle teeth are full, the corner teeth only remaining hollow: the tusks are sharp, with the sides fluted. At seven years old, the corner teeth are full, the tusks longer and thicker, and the horse is said to be *aged*.

Note. It is not meant that exactly at the periods above mentioned these changes take place in the horse; much depends upon his constitution; whether he be a late or early foal; also upon the manner in which he has been reared, as to food and shelter, &c. The corner tooth, too, might remain a little hollow after the age of seven, but the appearance is still very unlike the mere shells, which they are, at the age of six.

COMMON SCHOOL LIBRARIES.

[It will be seen, by the following article, that the legislature of New York has made an appropriation for common school libraries, upon the large scale of munificence and liberality, and enlightened regard to public interests, for which that great state has been distinguished, and by which wise course of policy it has already so eminently profited. New York is a *great* state, not so much by the natural advantages of her territory—great as these are—as by her wise and liberal legislation, for nourishing and sustaining education, agriculture, and all the important interests of the people. When shall we see the legislature of Virginia making even the tithe of the magnificent grant of that of New York, in the purchase of facilities for popular instruction, or any other mode for diffusing information, for the benefit of the agricultural community?

But while applauding the act, in general, its object and its tendency, we concur heartily with the editor of the 'Cultivator,' in preferring that the *subjects* of the books furnished should be very different. It is unnecessary here to repeat, in another form, the views presented to our readers in our recent remarks on the propriety of the state's furnishing agricultural books for the primary schools, (pp. 263-4); as all then said, if the case were applicable to Virginia, might as well be brought to bear on the libraries, as the ordinary school-books, for common schools. We are glad to have this indirect support of the editor of the 'Cultivator' thus given to our views. If his own excellent agricultural periodical were made to form so large a proportion of the school libraries of New York, as to be placed in the hands of every otherwise destitute boy, who is to be a tiller of the soil, it would be worth ten times the other value of the proposed libraries, and far more than the whole amount of the money appropriated for the annual purchases.—Ed. Far. Reg.]

From the Cultivator.

We were unadvised of the fact, until we saw it announced in a late Jeffersonian, that the legislature made an appropriation at its last session, of $45,000 per annum, for three years, for the establishment of common school libraries. We fully concur in the sentiments expressed in the following extract which we make from the Jeffersonian, as to the salutary influence which this judicious appropriation is likely to have in enlarging the sphere of useful knowledge, and in improving the condition of the producing classes of the community.

"We trust no friend of the great cause of universal education, no parent, no youth, no lover of his country, has forgotten or will forget the provision so wisely made by our last legislature for the establishment and support of *common school libraries*. We feel a proud satisfaction in contemplating the fact that New-York stands forth in this matter a pioneer and a glorious example to her sister states. The law making provision for the distribution of the annual revenue of the new common school fund, (arising from the deposit of the late surplus revenue with the states,) appropriates forty-five thousand dollars a year exclusively to this beneficent purpose. Each district in the state is entitled to draw its share of this fund, proportioned to the number of its scholars; and, estimating the whole number of districts at forty-five hundred, this sum would allow an average of ten dollars to each district, or thirty dollars in the course of the three years' duration of the law. We believe this estimate is rather under than above the truth; and that, with a very moderate display of public spirit on the part of the people, a very comprehensive and most useful library may be immediately secured to every school district in the state.

"The great advantages of this noble enterprise, to that very large proportion of our citizens who are unable to buy large collections of books, cannot be over-estimated. Not alone to children and youth will its benefits be dispensed. Parents and others of mature years can readily avail themselves of the fund of useful and instructive reading, which is thus brought to their doors. Even should the library consist of but fifty volumes at first, each family in the district may draw one volume from it per week for the whole year, returning it at the week's end for another; and thus

enjoying a supply of information and entertainment for the whole period without the cost of a cent. At the end of the year, a new instalment of the appropriation will be doubled, and another year's reading commenced. We firmly believe that in this way the library will be found a great auxiliary to the school, by creating a new interest in its management and its welfare. Should the district conclude to have a little gathering every Saturday evening, or some other evening, to exchange books, or return and draw again, a lyceum, or association for mutual improvement, would soon grow out of it, and still greater benefits be realized. Each parent and scholar would feel that he had a personal interest in the library, as well as the school; and thousands would spend their leisure hours in reading, which would otherwise be given, almost of necessity, to frivolous, if not corrupting amusements."

Thus far our quotation. But we are not prepared to go farther with the Jeffersonian—in its approbation of the selection of books designated and recommended as the *basis* of common school libraries. The Messrs. Harpers, to whom we accord great credit for their enterprise and industry, have printed, we are told, under the direction of the American Society for the diffusion of useful knowledge, a series of fifty handsome volumes, of uniform size and appearance, to be comprised in a neat case, and furnished at twenty dollars. These books, of which a list is given in the Jeffersonian, treat mostly of foreigners, foreign lands, and of matters foreign to the great pursuits of our country. They are the Lives of Bonaparte, Alexander the great, Peter the great, Oliver Cromwell, of celebrated travellers and female sovereigns; ancient and modern Europe, the Holy Land, the Crusades, Arabia, the Chinese, voyages, travels, &c. We see but eight volumes that seem from their title to relate particularly to our continent, and but about the same number that are written by Americans. But we do not recognize one, among these books—which are designed almost exclusively for an agricultural community—we do not recognise a single volume on agricutural chemistry, or on agricultural botany, or on agricultural geology, or on the mechanics of agriculture, the great modern lever which simplifies, abridges, and at the same time augments the products and profits of human labor; we see nothing on the veterinary art, or the management of cattle—nothing upon practical agriculture or horticulture—and little, if any thing, upon the moral, relative and political duties of life. The studies to which we have last alluded, ought to form the foundation, the basis, of a rural education; those selected might become auxiliary, or supplemental; or, the two classes might be blended like brick and mortar in the walls of a building, to give beauty, as well as solidity, to the structure.

It needs no argument of ours to convince any reasonable man, that the proper study of youth, is the business which is to employ them in manhood. Thus we give to the law student elementary books in the business which is to constitute his living; and to students in divinity and physic, the elementary books suited to their several professions; and we require a four years' study in these elementary works, in order that the student may fully understand the principles upon which he is to preach or practice, before we permit him to put on the toga of manhood, and to take rank with his profession. And shall not the student of agriculture, whose business embraces a wider range of useful science than either of the before mentioned classes, be permitted, during his minority, to study the elementary principles of *his* profession?—to store his mind with the preeepts and practices of eminent men in that profession? We say, lay the *foundation* in usefulness—in that knowledge which will tend to make intelligent, useful and contented farmers, and good citizens, of the boys of our common schools. You may then build whatever superstructure you please upon this solid foundation, and embellish it to your taste.

But we are reminded, that we are treading on hallowed ground; that the society for the promotion of useful knowledge, with Gov. Marcy as its head, have sanctioned the selection that has been made, and, as if to silence every doubt, that Gen. Dix, superintendent of common schools, has also given it his approbation. Without wishing to derogate, in the least, from the high character of the gentlemen who constitute the society, or to depreciate their efforts to do good, we must be permitted to doubt their pre-eminent qualifications for selecting a suitable library for an agricultural community. Most of the gentlemen, we believe, belong to the learned professions, or to the mercantile class; and we are willing to award to them a high standing in literature and general science; yet few of them, we apprehend, know much of the practice or theory of farming, a business which stands first on the roll of usefulness, and which it is the interest of every class of the community to enlighten and improve; and they are therefore not exactly best qualified to promote this great object of national prosperity, be their intentions ever so patriotic. Or at least so we are obliged to infer, from the catalogue of books which have been published. And as for our highly respected secretary of state, he is no doubt well qualified to select a law or literary library, or to thread the mazes of politics—yet we should not venture to trust him, with all his qualifications, to select *our* library, or manage *our* farm. Would these gentlemen trust an association of farmers, however intelligent, to select their *professional* libraries? We think not.

But perhaps we are going too far: something on agriculture is promised in the next series, and we ardently hope it will be furnished.

After all, it may be said, and will be said, and by thousands of farmers too, that agriculture wants no auxiliary aids; that it has done well enough, heretofore, without the aid of books or of science—and that it can continue to do so. How would such a remark apply to the other arts of labor? Look at the cotton factory for instance—a yard of cotton goods may now be purchased for half the price which was paid for barely *weaving* a yard thirty years ago. The manipulations in most of the other arts have been so abridged by machinery, and the processes so simplified by science, that the fabrics produced by these labors are greatly lessened in price. In these arts, the improvements of the age are speedily registered and promulgated in books and periodicals. Mechanics and manufacturers know how to appreciate this sort of book knowledge; and it enables them to keep pace with the improvements of the age.

Not so our farmers generally. They have little intercourse with each other; they have no access to agricultural books, and many are too old or too prejudiced to seek for or receive information. The consequence is, that we are making slow progress in agricultural improvement, while agriculture is being made to double, treble and quadruple its products upon the old continent. Youth is the appointed time, and the only time that can be relied on, for implanting the knowledge and the principles which should guide and govern in the business of manhood—and of laying the foundation for good citizens and intelligent, prosperous farmers.

From the Maine Farmer.

TO PREVENT DOGS SUCKING EGGS.

It sometimes happens that the *sometimes useful, and sometimes useless* animal called a dog, finds out eggs are very good eating, and takes the liberty to "lay his jaws" to every one that he meets with—taking, also, like some other servants, with not quite so many legs—the meat to himself, and leaving the shell to his master.

A friend of ours once had a "Bose," which he was very found of, and which was in most respects, a very sedate, worthy sort of a dog, but he had the trick of sucking every egg he could find.

Having heard that a dose or two of tartar emetic would make him sick of that business, he accordingly tapped one end of an egg, put in a lot of the tartar emetic, and laid it down in his dogship's path, who forthwith helped himself to its contents, without ceremony. He was then kept without water, and occasionally, from time to time, supplied with a *medicated* egg, till Bose began to find that the very sight of them was a signal for a fit of sickness, and wisely resolved to quit the business, which resolve he kept, as a good and faithful dog should. If you have a "good for nothing dog," and he sucks eggs, shoot him. If you have a good dog and he sucks eggs—*doctor* him.

MANURING IN SOUTH CAROLINA. MARSH GRASS, MARSH MUD, AND LEAF-LITTERED COW-PENS.

Extract from the Address of Joseph E. Jenkins, to the Agricultural Society of St. John's.

All animal, vegetable, and many mineral substances, may be converted into manure. With the two first we are most conversant; the last has not yet sufficiently occupied our attention, with perhaps the exception of salt, which, as a component part of the marsh mud, has been long and successfully used. Some of our members have, within a year or two, used it in its raw state, but the results have not yet been sufficiently satisfactory, nor the trial sufficiently extended, that we should at present dwell upon them. On those gentlemen, we may with confidence rely for statements at the proper time. The manure most commonly in use amongst us, is vegetable, decomposed in our cow-pens, where leaves of trees (principally of the pine) are dunged upon and trampled by the cattle. It is the common usage of this section of country, to lay by, or more properly speaking, leave off working the growing crop at or about the tenth day of the present month, (July), after that period, it is considered by some of our best planters as rather hazardous to meddle with, as any new excitement, by stirring the earth around the root of the plant, which would cause a new growth, would at the same time cause a disastrous falling of the young fruit or capsules. We may consider it, therefore, as a pretty general rule. growing out of experience, (that best of teachers,) at this period as most advantageous to go to something else, and that something else is the collection of manure. We are bountifully supplied with all the requisites; the leaves of the pine appear to be prolific for the especial purpose of furnishing us with an excellent substance for our use. The borders of our rivers, which are numerous, intersecting our islands in every direction, abound in a highly nutritious marsh grass, of easy access, of a tender stalk, very convertible into muck manure. A few months' trampling, either in the cow-pen or stable, renders it a mass the most powerfully stimulative of any manure with which we are conversant, so much so indeed, as to have induced the belief, that its exhibition upon what is called table lands of a dark loam, has a tendency to cause the cotton plant to overgrow; and on lands impregnated with whatever substance it is that causes blue, to fall more certainly, and to run into vines. In this state, its product is beggarly indeed. I have seen portions of cotton fields, whose product was not a solitary pod.

Marsh mud is our next important material. This substance is abundant to superfluity, and the experience of every planter on this Island, with the exception of one or two, has sustained it as highly advantageous and profitable. Its tendency is to render loose lands more tenacious—to restore the original stamina to worn out or exhausted soils, causing thereon the stalks to hold the fruit, as in its virgin or original state, but it has been doubted whether it has a direct action in producing luxuriance of vegetation. This is a matter of little importance, and I shall not stop to consider it. There is a remedy, if it is so, which the very nature of the location points out emphatically to our view—this is simply a combination of the marsh grass with it. To effect this, two years ago I commenced the following process—eight fellows were furnished with scythes to mow down the marsh [grass;] eight more placed in boats and flats, to gather up and convey it to a place of deposit at the margin of the river. They thus conveyed each day sixteen cords, or a cord a piece for each hand employed. Day by day we did this, from Monday morning to Friday night, depositing along the margin of the river, within the reach of the high tide, consecutively, each day's cutting. On Saturday, at low water, all hands upon the plantation, both these and others, let their employment be what it may, were called, and with hand-barrows, covered the whole surface of the marsh with mud, from one to one and a-half foot thick. The weight of the mud compressed, and held firmly in its position, the marsh under it—the tide at high water passed through the compressed marsh, hastening wonderfully the process of decomposition, and at the time when it was taken up in the spring to be conveyed upon the

land, it had (that is the marsh) a black look, as if ready to be resolved into its original elements. The hoes with which it was cut away, passed through it with peculiar ease and facility, as much so almost, as if it had been all mud. This process of making manure, recommends itself on several grounds—first, its entire and perfect mingling, and thereby meliorating the condition of each of two substances, the one thought dangerous from the excess of strength; the other held useless by some for the want of it. Secondly, the saving of extra carting to the cow-pen, to be trampled as in the usual way—and thirdly, the great facility with which they are brought to the place of deposit. I have seen the negroes, when cutting on the side of the river where the heap was to be made, leaving the boats, collect into great masses the cut marsh, and getting behind them, push up an immense quantity to the shore with the greatest ease. With the mixture thus collected last summer, I manured this spring fifty-nine acres, at the rate of forty loads to the acre, which I hold to be as profitable an investment of the work of sixteen hands for two months, as well can be made, being at the rate of three acres and three quarters to the hand.

The making of cow-pen compost, with pine trash and other leaves, was effected by the women. The light trash was raked up and placed at the edge of the woods, whence the trash carts conveyed it to the pen. Here I would remark upon the advantages which result from the proper structure of the trash carts. An entire body of light stuff, in open lattices, should be so fixed up at the sides and back, as that a two ox wagon should hold a cord of pressed leaves; two oxen in proper keep, will, with apparent ease, draw this much. These useful animals, patient and sturdy, require in the summer much care and attention—an inhuman driver, inattentive to their wants, will soon destroy them. They cannot work long without water; they require immeasurably more than either the mule or the horse to sustain them—but with this requisite properly attended to, they can perform from their superior strength, although slow of gait, almost as much work as either. The primest fellows, therefore, and most industrious, should be detailed for this service, otherwise time will be idled away in the morning, which to regain, the animals will be overworked in the afternoon, and thus suffer much maltreatment and abuse. Drivers of oxen should never be indulged in carrying large sticks in their hands; a small switch, or a thong of leather fastened to a handle, is quite sufficient, for these docile and tractable animals easily learn the word, and are as well so directed, indeed better, than by the most severe blows that can possibly be inflicted. Their yokes should be light, with the haimes or bows fitting tight around the neck; by allowing them to be too loose, they play upon the working of the shoulder blade, and inflict dreadful wounds, lacerating the skin in a shocking manner, and incapacitating the animals for the performance of one half their labor. With regard to the application of manures, that must mainly depend upon the previous state of the lands on which they are to be used. The usual quantity allowed to the cotton crops, is from twenty to thirty loads of compost to the acre, and from forty to eighty of marsh mud, but it is seldom that these extremes are reached, more commonly the lesser than the greater. The apprehension which, when we first commenced manuring, I heard expressed by some, that manuring would in the long run prove more injurious than beneficial, has I think entirely subsided. I presume there is not within the sound of my voice, I may say indeed within the bounds of this parish, a planter who would now be willing to subscribe to such an opinion. Like other schemes of improvement, it at first had its opponents, but like all useful innovations, it has outlived to detraction. Could I learn the name of the first man in this parish who made a compost pen, and had I it within my power, his fame should be spread abroad, and his name be immortalized; for he has rendered to us an inestimable blessing, and far be it from any one to withhold his meed of praise.

From the Farmers' Cabinet.

WHAT IS THE GREATEST QUANTITY OF MANURE TO BE OBTAINED FROM GIVEN MEANS.

Mr. Editor—There are in agriculture, as perhaps in every science, some leading propositions, calculated in a particular manner to arrest attention by their prominent importance. Such I hold that of a "Subscriber" in your May number—"*What will an acre of land produce?*" and also the question which heads this article.

Were it possible at once to afford a complete and palpable solution to these two propositions, what mind can calculate the vast increase of treasures that would instantly become accessible to humanity? As then, we cannot inquire too strictly, or know too much regarding them, I propose, after recapitulating a few of the principal statements of a "Subscriber" concerning the latter question, to furnish my own experiments upon the former.

He informs us that a single acre of his land, *with abundant manuring and superior cultivation*, was made to produce the sum of $348 40 cents per annum, for five successive years, besides the vegetables used in a small family. He further states in substance, as his present convictions that the quantity of soil cultivated has nothing to do with the secret of gathering money out of it; that "this altogether depends on a judicious selection of soil, *on the facility of obtaining manure;* and on the proper application of it as food for plants," &c.; that he found, by actual experiment, made upon a large scale, "that the profit of capital laid out in land produced an interest of only *five* per cent. per annum, the capital laid out in manure upon the same land produced *twenty* per cent."

Now, my own experience, as I shall presently show, abundantly confirms the probable accuracy of all these statements. Let us distinctly understand, then, that it is not the great quantity of land, but *the abundance of manure* upon a little, that is alone required to give wealth and independence; that the man who owns five or six acres may, (according to the above data,) with the aid of manure and good management, draw from $1,800 to $2,000 from them each year, while he of a hundred acres may scarcely obtain half of it upon the common plan.

But where is the requisite manure to be obtain-

ed that shall so suddenly and surely enrich the farmer? In reply to this, I will simply give my own experience, and by it endeavor to convince the reflecting farmer what amount can, and in fact *has* been made from means incomparably more limited than is generally imagined possible.

Previous to 1829 I had followed in Philadelphia a sedentary occupation, which, by excessive application in it, had so enfeebled my constitution, that I was obliged to seek in the country for that measure of health which I might no longer hope for in the city. So I bought, with my scanty savings, a small place of ten and a half acres, and moved upon it the same fall, of 1829.

Not being acquainted with farming, I hired a man to plough two and a half acres, and sow it in rye. The cost of seed and labor, in putting in, gathering, and thrashing the said crop, was $8 56 cents. The crop yielded five and a half bushels of very poor black rye, fit only for hay feed—say at forty cents per bushel, (as good rye was then selling at fifty-six cents per bushel,) was worth $2 02 cents, and the net loss sustained upon farming the ground was $6 36 cents. The season was moderately good for grain, and the two and a half acres rather a favorable specimen of the rest of my land! I planted a potato patch the following spring (1830,) of about one-fourth of an acre, which I manured in the hills with one load of marl only, and the crop yielded but three and a half bushels!

Being a total stranger to the nature and character of soils, but having previously, from some cause, entertained the notion that land in general produced about twenty-five bushels of wheat, or forty bushels of corn, or four or five loads of hay to the acre, the conviction I had now received of the absolute worthlessness of my land fell upon me like the shock of a thunder-clap. Discouraged by the greatness of my disappointment, but not quite confounded, I determined that manure, in future, should be every thing to me, and stand in the stead of both land and crop. Being greatly improved in health, by the change of situation and exercise, I plied my avocation with increased diligence for the maintenance of my family, and made it the amusement of my leisure hours and leisure moments to collect from every corner, and pannel of fence, every thing that I imagined could furnish a vegetable nutriment, and placed it in my cow-yard, so combined with the litter as to absorb and retain every thing of a putrescent character that might be deposited there. By such means I have gone on, every year increasing the quantity of manure, to an extent that I believe has astonished most of our neighbors. The following is a sketch of the means I possessed, and the methods I took to obtain manure for the present year.

I commenced last summer by collecting into the outer part of my hog-pen every thing of the weed kind I could find about the place, till I had a layer about twelve inches deep, which I covered with a layer of earth about five inches thick, continuing the process till the pen was filled to about two and a-half feet deep. In the fall I littered my loose corn-cobs and the principal part of the buckwheat straw into the pen, interspersed with layers of earth in the same manner. The two stalls of my stables I served also the same, taking care to save therein all the chaff and refuse straw after thrashing. In these stalls I poured weekly, through the fall and winter, (for I had no cattle in them except in bad storms,) the soap-suds and such putrescent fluids that might be obtained, keeping the corners, and outsides, and under the mangers, carefully saturated.

As soon as my corn was gathered in the fall, I cut the stubs close to the ground, and wheeled them immediately, *while yet heavy*, into the barn-yard, where I packed them in every part of it, and also under the shed, being an area of ground about forty feet by twenty, and in a few days covered them also with a layer of earth, from a fence-row close by, to the depth of about eight or ten inches. Upon this earth I foddered my cattle during the winter, occasionally depositing more earth upon the litter as it collected there.

Your readers will readily judge, that the object of all this preparation was not so much for the sake of saving the materials collected there as to obtain a menstruum, or rather *sponge*, if I may so call it, calculated to absorb and retain all the urine deposited in the yard during the winter. The compost masses, however, or layers, thus collected together, are not to be considered as manure prepared for the soil, but only as *materials* that require to be thoroughly *mixed*, in order to reduce them to a state fitted for a rapid and complete incorporation with the soil. Accordingly, with this view, I commenced late in April the operation of turning it, which, from its having become closely packed to the depth of twenty inches, with the stalks at the bottom, could only be done with the aid of a grubbing hoe, turning it in strips about a foot wide, reaching across the yard, and throwing the loosened manure back a sufficient space to allow a trench between, wide enough to work in. After removing the whole cover from the stalks along a strip, as before mentioned, they were easily grubbed up, first cutting them through all along the solid edge of the strip with the hoe, it being made pretty sharp for the purpose. In addition to this pile of yard manure, I have also emptied the contents of my hog-pen and stables, extending the pile several feet, and lying upon the ground, when first loosened, more than two and a half feet deep. Of this manure I have used sixteen loads this spring, for truck and garden, and, judging from the size of the pile yet remaining, there cannot be less than sixty loads, which, being turned once more, I intend to use for wheat next fall.

In this manner, from only three head of cattle, and the fattening of four hogs, I have made from seventy to eighty-two horse loads of manure, the highly fertilizing properties of which are abundantly attested by my own former experience. I will not say that it is stronger than the best barn-yard manure, but from its closer affinity to the nature of the soil, and greater facility for being rapidly combined and incorporated, without loss by evaporation, I have no doubt it will be frequently found, upon trial, more effective and more durable.

In the process of turning manure, thus prepared, I hold it of the highest importance to mix well the earthy and vegetable parts together. Few persons are perhaps aware how rapidly the earth facilitates vegetable decomposition, and to what a surprising degree *it absorbs the excess of fertilizing effluvia*, which must otherwise be evaporated during the process of decomposition. This circumstance, I believe, taken in connexion with the careful economizing of all animal excretions, con-

stitutes chiefly the great secret (I might, perhaps, add *alleged* necromancy,) that has added already so much verdure to my previously exhausted soil, and been so profitable to me, and so surprising to my neighbors.

No farmer can imagine, that has not tried the experiment, what a prodigious quantity of rich, vegetable, and fibrous earth may be collected from corners and by-places, which lie out of the way of cultivation, and which, from their retired position, have, perhaps, never so much as attracted his notice. All such refuse trash, and fibrous earths and weeds, by being conveyed to his barn-yard, at intervals, during the fall and winter, and judiciously combined with its contents, will be converted into a rich, fertilizing, and durable manure, merely by absorbing and retaining *that excess of putrescent fluids and effluvia,* which is otherwise lost by filtration and evaporation; that is, by soaking away and drying up. W. H.

Pittstown, Salem Co. N. J., May 20th, 1838.—

From the Farmer's Series of the Library of Useful Knowledge.

FLEMISH HUSBANDRY.

The poor sandy heaths, which have been converted into productive farms, evince the indefatigable industry and perseverance of the Flemings. They seem to want nothing but a space to work upon; whatever be the quality or texture of the soil, in time they will make it produce something. The sand in the Campine can be compared to nothing but the sands on the sea-shore, which they probably were originally. It is highly interesting to follow, step by step, the progress of improvement. Here you see a cottage and rude cow-shed erected on a spot of the most unpromising aspect. The loose white sand blown into irregular mounds is only kept together by the roots of the heath: a small spot only is levelled and surrounded by a ditch; part of this is covered with young broom, part is planted with potatoes, and perhaps a small patch of diminutive clover may show itself: but there is a heap of dung and compost forming. The urine of the cow is collected in a small tank, or perhaps in a cask sunk in the earth; and this is the nucleus from which, in a few years, a little farm will spread around.

In another spot more extensive improvements are going on; a wealthy proprietor or lessee is trenching and levelling the surface, sowing broom-seed, and planting young fir-trees, which are to be cut down in a few years. In another, the process has gone on further, the firs or the broom are already cut down: a vein of loam has been found, and is dug out to be spread over the sandy surface: the cart with liquid manure is preparing the surface for the reception of seed, or the same, diluted with water, is poured over the young blade just appearing above ground. The soil is created, and, if the cost and labor were reckoned, is paid for at a dear rate: but perseverance insures success, and there are few instances of improvements being abandoned, after they are fairly begun, unless they were undertaken on too large a scale; but then the land is soon divided into smaller portions, and improvements go on from different centres, and with more certainty.

We are here describing the labor of bringing a soil absolutely barren into a state of cultivation; but in most of the districts which have been originally waste and covered with heath, and which are now fertilized, a less ungrateful soil was found. Deep trenching and levelling at once presented a surface which required only to be manured to produce rye, flax, and potatoes. This is what we should call a moderately good sand, in which a small portion of clay and oxide of iron produces a certain degree of compactness, so as at least to retain moisture: under this kind of sand a stratum of loam is usually found at the depth of two or three feet, and, almost invariably between the sand and the loam, an indurated crust of earth cemented by carbonate of iron, which is well known to all improvers of poor sands by the name of the *iron pan:* this pan must be broken up and the loam under it mixed with the sandy surface, before any cultivation can succeed; and in this operation the Flemings are very dexterous. The instrument they use is a light wooden trenching spade, the end of the blade only being shod with iron: the handle of this spade is about two feet long, the blade from twelve to fifteen inches. A light pick-axe is used to break the pan where it appears. A ditch is dug with the trenching spade, two or three feet wide, and as deep as the trenching is intended, generally two feet, or at least twenty inches; this ditch is filled with the earth which is taken in long thin slices from the edge of the solid side of the ditch. Every slice is distributed carefully, so as to mix the whole, and keep the best soil at top, and likewise to fill up hollows and level eminences. If there is more than can conveniently be spread level, little heaps are made of the superfluous earth, which are afterwards carried, in an ingenious manner, to fill up more distant hollows, by means of horses and an instrument which is called a *mollebart.* Wherever there is a pan, it is carefully broken, and the loam, which is always found under it, is mixed with the sand dug out. Draining is seldom required here, except that which is effected by making deep ditches to carry off the superfluous rain-water, which, in a country almost as level as a lake, is no great difficulty. A canal near at hand is, however, an essential condition of extensive improvement, to bring manure, and carry off the produce of the land, as well as to be an outlet for the water in the ditches. When Count Chaptal traversed a barren part of Flanders, accompanying the Emperor Napoleon, the latter expressed his surprise, at a meeting of the Council of the Department, that so great a tract of land remained uncultivated in so industrious a nation. The answer was, "If your majesty will order a canal to be made through this district, we pledge ourselves that in five years it will be all converted into fertile fields." The canal was ordered to be made without delay, and in less time than they promised not an unproductive spot remained. (See Chaptal, "Chimie appliquée à l'Agriculture," vol. i. p. 347.) One great cause of the agricultural prosperity of Flanders is the ready transportation of manure and produce by canals. But to return to the newly trenched land. If there is no manure at hand, the only thing that can be sown on poor sand, at first, is broom: this grows in the most barren soils; in three years it is fit to cut, and produces some return in fagots for the bakers and brickmakers. The leaves which have fallen have

somewhat enriched the soil, and the fibres of the roots have given a certain degree of compactness. It may now be ploughed and sown with buckwheat, or even with rye without manure. By the time this is reaped some manure may have been collected, and a regular course of cropping may begin. As soon as clover and potatoes enable the farmer to keep cows and make manure, the improvement goes on rapidly; in a few years the soil undergoes a complete change: it becomes mellow and retentive of moisture, and enriched by the vegetable matter afforded by the decomposition of the roots of clover and other plants. It is surprising that so few sheep should be kept on these new farms. Sheep folded would do good by their tread, as well as their manure, but the management and feeding of sheep is a part of husbandry in which the Flemings, with very few exceptions, are decidedly as much behind our light land farmers, as they are before us in the feeding of their cows, and preparation and economy of manure.

If about twenty small cart-loads of dung can be brought on each acre of the newly trenched ground, the progress is much more rapid. Potatoes are then the first crop, and generally give a good return. The same quantity of dung is required for the next crop, which is rye, in which clover is sown in the succeeding spring; and a small portion is sown with carrots, of which they have a white sort, which is very productive and large in good ground, and which, even in this poor soil, gives a tolerable supply of food to the cows in winter. Should the clover fail, which sometimes happens, the ground is ploughed in spring and sown with oats and clover again. But if the clover comes up well amongst the rye stubble, it is cut twice, after having been dressed with Dutch ashes early in spring. It is mostly consumed in the green state. The clover-ley is manured with ten cart-loads of dung to the acre, and rye sown again, but not clover. After the rye comes buckwheat, without any manure; then potatoes again, manured as at first, and the same rotation of crops follows. It is found that the poor land gradually improves at each rotation from the quantity of dung used: and, as this is essential, it will be easily seen that without water-carriage the improvement could not go on: for the necessary quantity of dung could never be brought to the ground by land-carriage through the deep sandy roads, which are mere tracks.

For want of sufficient manure, broom-seed is sometimes sown with the rye after the clover. The rye is heaped and the broom continues in the ground two years longer. It is then cut for fuel. The green tops are sometimes used for litter for the cows, and thus converted into manure. It is also occasionally ploughed in, when young and green, to enrich the land. Oats, clover, and broom are occasionally sown together. The oats are reaped the first year; the clover and young broom-tops the next, and the broom cut in the third. This is a curious practice, and its advantage appears rather problematical. All these various methods of bringing poor sands into cultivation show that no device is omitted, which ingenuity can suggest, to supply the want of manure.

After the land has been gradually brought into a good state, and is cultivated in a regular manner, there appears much less difference between the soils which have been originally good, and those which have been made so by labor and industry. At least the crops in both appear more nearly alike at harvest, than is the case in soils of different qualities in other countries. This is a great proof of the excellency of the Flemish system; for it shows that the land is in a constant state of improvement, and that the deficiency of the soil is compensated by greater attention to tillage and manuring; especially the latter. The maxim of the Flemish farmer is, that "without manure there is no corn—without cattle there is no manure—and without green crops and roots cattle cannot be kept." Every farmer calculates how much manure he requires for his land every year. If it can be bought at a reasonable rate, he never grudges the outlay. If it cannot be purchased, it must be made on the farm. A portion of land must be devoted to feed stock, which will make sufficient manure for the remainder: for he thinks it better to keep half the farm only in productive crops well manured, than double the amount of acres sown on badly prepared land. Hence also he does not reckon what the value would be of the food given to the cattle, if sold in the market, but how much labor it costs him to raise it, and what will be the increase of his crops from the manure collected. The land is never allowed to be idle, so long as the season will permit any thing to grow. If it is not stirred by the plough and harrows to clear it of weeds, some useful crop or other is growing in it. Hence the practice of sowing different seeds amongst growing crops, such as clover and carrots amongst corn or flax; and those which grow rapidly between the reaping of one crop and the sowing of another, such as spurrey or turnips, immediately after the rye is cut, to be taken off before wheat sowing. These crops seem sometimes scarcely worth the labor of ploughing and sowing; but the ploughing is useful to the next crop, so that the seed and sowing are the only expense; and while a useful crop is growing, weeds are kept down. These are the general principles of Flemish husbandry.

* * * * * * *

The collection and application of manure is the great secret of Flemish husbandry. Upon their poor light soils nothing could be raised without an abundance of manure. It is, consequently, an object of minute attention to the Flemish farmer to collect as much as possible, and to apply it in the most advantageous manner. For this purpose the dung of the different domestic animals is generally kept separate, especially that of cows, from that of horses; the former being thought better for dry sandy soils, the latter for colder loams and clays. They look upon pigs' dung as being cold and inferior, adopting in this respect the opinions of the ancients. We think differently; but this may be easily accounted for. The Flemish store pigs are fed in the most miserable manner, and are merely kept alive on weeds taken from the fields, or by very scanty grazing in rough pastures. We need not be surprised, therefore, that their dung is poor. The cows are better fed, and their dung is consequently richer. Cow dung is thought to last longer in the soil, and its effects on the second crop are more conspicuous than that of horse dung, which stimulates more and is sooner effete. Sheep, which are so important to the light-

land farmer in England and Scotland, for their manure, are not kept in sufficient quantities in Flanders, nor well enough fed to do much good to the land. They are commonly housed every night, and driven about in the day to gain a scanty subsistence along the roads and sides of the fields. The manure collected in the sheep-fold is carried out on the land, and its effects are duly appreciated. A flock is occasionally folded on a clover-ley before it is ploughed up, but never on the turnips, which are always given to the cows. This is owing to the small extent of the farms, which do not allow of a considerable flock of sheep being kept by any one farmer; but a flock is made up of different lots of sheep belonging to several proprietors, and put under the care of a common shepherd, or it is sometimes the property of the shepherd, who occupies no land, but lets out the sheep to fold, or sells the manure.

But the great auxiliary of the Flemish farmer is the URINE TANK, wherein are collected not only the urine of cows and horses, but also the drainings of the dunghills. The urine tanks are generally sunk below the level of the ground, and have the sides built of brick, and the bottom paved: they are of various dimensions, according to the numbers of cows and horses on the farm. Attached to the distilleries, where many beasts are constantly kept to consume the refuse wash, there are very large urine tanks of an oblong shape, divided by partitions into different chambers, so that the liquor may be of proper age when it is used, which some farmers think ought to be six months. Each chamber is about eight feet square and six or eight feet deep; these are sometimes vaulted over, but frequently only covered with loose boards. As urine and the emptying of privies are sold wholesale and retail, there are many large tanks near the rivers and canals, where the dealers have sometimes great quantities in store. Some of these consist of many square pits like tan-pits, bricked round, and the inside covered with a cement, which prevents loss by filtration. There is generally in a corner of each pit a graduated scale, by which the number of barrels, or tons of liquid in the tank may be ascertained by observing the height of the surface. These tanks are gradually filled by boat-loads brought from the large towns; and when the season arrives for sowing, in spring and autumn, the farmers come with their carts and tubs, and purchase as much as they may want. The price varies from three to five francs (two shillings sixpence to four shillings) per hogshead, according to the quality. In a small farm of thirty to forty acres the tank is generally about twenty feet long, twelve wide, and six deep, with a partition in the middle, and arched over, leaving an opening for the pump, and another sufficient to allow a man to go in to empty out the earthy deposit which falls to the bottom. A trap-door shuts over this aperture to prevent accidents. Sometimes the tank is round, like a well, with a domed top, and so deep in the ground, that it has a foot or two of earth over it. The situation of the tank is either in the farm-yard near the entrance of the cow-house, or immediately behind it; sometimes it is like a cellar under the building; but this is apt to cause a disagreeable smell in the cow-house. We here describe those which we consider the most convenient: the form and capacity of the tanks vary greatly according to the means and notions of the proprietors of the farms: but a tank of some kind or other is considered as indispensable an appendage to a farm as a barn or cow-house. The farmer would as soon think of dispensing with his plough as with his tank; and no expense or trouble is spared to keep this well suppled. The numerous towns and villages in Flanders afford great help in the way of manure. The thrifty housewife and her active substitute the maid, know the value of what in our households is thrown away or wasted and lost. A small tank, or a tub sunk in the ground in some corner contains all the liquid which can in any way be useful; soap-suds, washings of dishes, &c., are carefully kept in this reservoir, until, once a week, the farmer or contractor calls with his tub on a cart; and this, mixed with the contents of privies, which are frequently emptied, he keeps in large cisterns for use or sale.

But this supply is not always adequate to the wants of the farmer, and then he has recourse to rape cakes dissolved in water, or in the tank, which is expensive, and can only be profitable where flax bears a good price, this being the crop for which rape cakes are chiefly used as manure. Every means, therefore, of augmenting the supply of urine is had recourse to, and the most efficacious is the establishment of distilleries. These answer the double purpose of consuming produce and increasing manure by the number of beasts which are fattened on the refuse wash. It is calculated that every beast produces at the rate of ten or twelve tons of dung and twenty-six hogsheads of urine in the year. A moderate distillery has fifty or sixty head of cattle constantly stalled. Here then is a supply of manure for several hundred acres of land every year. Formerly there were a great many distilleries in Flanders, but the duty on spirits and the interference of the government has much reduced their number; so that the farmers complain of the loss of this manure, and the consequent deficiency of their crops.

The dung of pigeons and domestic fowls, where it can be collected in any quantity, is highly valued. The mode of using it is either in a dry and powdered state, to which it is reduced by thrashing with a flail, when it is sown with the seeds of leguminous plants, or else dissolved in the urine tank, and thus spread over the land. This manure is chiefly reserved for kitchen gardens; it promotes the growth of vegetables and produces no weeds.

The solid dung, from which the liquid has been allowed to run off into the tank, must be carefully attended to, that it may not be too dry and become *foxy*, as it is called, or burn. It is therefore mixed up with earth and any useless vegetable matter which can be collected into a heap or compost; and when it appears too dry some of the liquid from the tank is poured over it, to excite fermentation and accelerate decomposition, or it is merely watered, when there is sufficient strength in it to produce heat.

In order to increase as much as possible the quantity of solid manure, there is in most farms a place for the general reception of every kind of vegetable matter which can be collected: this is a shallow excavation, of a square or oblong form, of which the bottom has a gentle slope towards one end. It is generally lined on three sides with a

wall of brick to keep the earth from falling in, and this wall sometimes rises a foot or more above the level of the ground. In this pit are collected parings of grass sods from the sides of roads and ditches, weeds taken out; of the fields or canals, and every kind of refuse from the gardens: all this is occasionally moistened with the washings of the stables, or any other rich liquid; a small portion of dung and urine are added, if necessary, and when it has been accumulating for some time, it is taken out, a portion of lime is added, and the whole is well mixed together; thus it forms the beginning of a heap, which rises gradually, and in due time gives a very good supply of rich vegetable mould, or compost well adapted to every purpose to which manure is applied. The place where this accumulation is made is called in French a *croupissoir*, and in Flemish or Dutch *smoor hoop*, which may be translated *smothering heap*.

Besides the manure which is collected on the farm, the *vidanges*, or emptyings of privies obtained from the towns, and the sweepings of streets, a large quantity of peat ashes imported from Holland are used, principally as a dressing for clover. These are the ashes of the common fuel in use in Holland, and are sold in Flanders by the bushel, as the Newbury ashes are in Berkshire.

Wood ashes, after the greater part of the alkali has been extracted for bleaching, are still considered as of great use to the land. Soapers' ashes are in great request for cold heavy soils; and sugar scum from the refiners, if it could be procured in sufficient quantity, would be an excellent manure for every kind of soil. Where it can be obtained, they usually throw it into the urine tank; and the mixture is then considered as almost equal to the vidanges, which are looked upon as the *ne plus ultra* of manures. Soot is used as a top-dressing for wheat, or clover in spring, as it is with us. It is thought to destroy insects and hasten vegetation.

The weeds, which grow abundantly in all ponds, canals, and ditches in this level country, where the current is never rapid, are mown in spring, and used in the green state as manure for potatoes. They are laid in the furrows, and the sets placed over them; the furrow is then filled up by the plough, and the weeds decomposing very rapidly, greatly assist the growth of the potato plants: so rapidly do these weeds ferment, that much of their value is dissipated, if they are left only forty-eight hours in heaps before they are put into the earth.

The manner in which manure is applied to the land for different crops will be explained as these are separately treated of: but the general principle which pervades the whole system of manuring, is worthy of attention. Two great objects are always kept in view. The first is to obtain the most abundant crop of whatever is sown: the next is to impregnate the soil with an increasing power of production, if possible, or at least to maintain that which has been obtained. In consequence of this, almost every crop has a certain portion of manure applied to it, which varies according to the nature of the crop to be raised, and that which has preceded: experience having taught that some crops exhaust the soils more than others.

But it is not the mere surface that they desire to manure. They well know that the deeper the soil is fertilized, the greater will be the profit and the less the labor. They are not satisfied with enriching the land to receive the seed, they furnish food for the growing plant in different stages of its growth, if they think it necessary. There is in consequence no fluctuation in the growth, no check at a time when the plants require support. The seed is made to vegetate rapidly by being in contact with the rich juices of the manure; and hence a much smaller proportion of seed is required. The young blade is invigorated by a judicious watering, and is sooner out of danger of the attacks of insects.

Liquid manure is carried to the fields in common water-carts, which consist of two wheels and shafts, carrying a cask containing from sixty to one hundred and twenty gallons of liquid. The cask has in the under part a hole, two or three inches in diameter, secured inside by a valve: under this is a board a little slanting, to spread the liquid as it flows out of the cask. A man usually rides on the horse which draws the cart, and holds in his hand a string, which passes through a hole in the cask, and opens the valve when required. There is an advantage in riding on the horse, as it does not add to the weight of the load on the wheels, which in light soils would be apt to sink deep. In a momentary exertion it assists the horse by the weight on his back; and the heavy Flanders horses are well able to carry a man and draw a light load at the same time. When the cask is empty he trots home for another load, and no time is lost. It is astonishing what advantage there is in accustoming horses to trot when they have no load; it actually fatigues them less than the continued sleepy walk. Who would suppose that the Flemish and Dutch farmers surpassed us in activity? but whoever has been in the Netherlands in hay-time or harvest must acknowledge it.

The dung which is carried in a solid state, is generally used at a time when it is in a state of active fermentation, as it is then supposed to have the best effect. To ensure this in some districts, as the Waes country, where the minutest attention is paid to every circumstance which can increase fertility, the dung is laid on the field in moderate heaps, and on each heap a certain quantity of urine is poured to excite and renew the fermentation: when it becomes sensibly heated, the dung is spread out and immediately ploughed in. After ploughing in the manure, the land is left for some time, and then a second deep ploughing is given to incorporate the decomposed dung with the soil, but so as not to bring any to the surface. A short time before sowing, the liquid manure is poured over; and this enriches the surface to make the seed germinate sooner.

Lime is not much used in the light soils, but commonly in the cold and stiff. As it is generally brought from a distance, it is dear; and this prevents any extensive application of it. Marl is found in a few spots, and serves to improve the poorer lands within reach of it.

BONE MANURE.

In consequence of the extensive introduction of this new species of manure into our highly im-

proved system of agriculture, thousands of acres that would have been doomed to nearly total barrenness have been brought under the most promising cultivation. As yet, the supply has not kept pace with the demand. It will somewhat surprise our readers, that, in the county of Forfar alone, 153,000 bushels of bones were used last year—a quantity which, at three shillings per bushel, would cost, as nearly as may be £23,000! This great supply came from Russia. But, for reasons not precisely known, the Russian government have issued an ukasé, whereby bones to be exported must, after the 1st of January next, pay a duty so high, that it is almost certain the supply from that country will be wholly cut off.—*Edinburgh Observer.*

From the Penny Magazine.

PIGEON-ROOSTS.

There is an extensive district of country stretching eastward from the head waters of the Ohio, through the northern parts of the states of Pennsylvania and New York, which, from the major part of the forest trees being beech, is known by the general appellation of the "Beechwoods." When there is a favorable season for the beech-tree bearing nuts, which is not always the case, the whole surface of the ground is strewn with them by the gales, about the period when the early snows begin to fall. The beech-nuts remain beneath the snow unmolested during the whole winter; about the time when the influence of the spring causes them to vegetate, myriads of pigeons are attracted to that part of the country, where they continue to sojourn, while this, their favorite food is in tolerable abundance. In case the temptation is exceedingly strong, the old birds will sometimes nest and breed again; the place they select being generally along some ridge or eminence, where the branches of every tree become literally loaded with their rudely-constructed nests. When the time of incubation is over, the neighboring settlers resort to the breeding-ground; and as powder and shot are expensive articles in the Backwoods, the woodsman's favorite weapon—the axe—is called into operation; such trees as are of a moderate thickness are hewn down, and hundreds of young and simple pigeons, some in the nests and others perched upon the branches, are brought to the ground. Bags and sacks are then put in requisition, and such as are of approved size are huddled by scores into those unsportsmanlike receptacles; whilst numbers of the rejected are left to perish by hunger, if they have unfortunately survived the concussion caused by the falling of the tree. When the parties get tired of "cutting down and picking up," and have got themselves and their horses (for many bring horses to those "pigeon frolics") pretty well loaded, they set out on an expedition of "pigeon peddling" among such as have either no time or taste to engage in this rude and barbarous recreation.

The breeding-ground is altogether distinct from the pigeon-roost; while the old ones are hatching their second broods, the young wanderers from the south are left to take care of themselves. Throughout the whole of the beechwoods there are low and swampy pieces of ground designated "Beaver Meadows." Those swamps, for the most part, are overgrown with tall coarse grass; and around many of their margins grows a profusion of alder bushes, seldom attaining more than fifteen or twenty feet. Why or wherefore the pigeons select those bushes for their roosting-places might be somewhat difficult to conceive, since the forest-trees in the immediate vicinity would afford them much greater security; but such is the case at present, and such it is known to have been.

Although the nests and their inhabitants are exceedingly numerous in the forests where they breed, yet the number of pigeons that roost in one of those "alder-swamps" upon which they chance to fix as a rendezvous, surpasses all belief. There are thousands and tens of thousands, and in some cases hundreds of thousands! and they are therefore so closely stowed together that they support and rest upon each other. The assailants, instead of going armed with guns, or even with axes, carry a pretty long pole or club, and a few dry pine-knots, to light up when they get to the roosting-place, not forgetting sacks wherein to deposit their victims. Having reached the pigeon-roost towards midnight, a light is struck, and the blaze of one or two of the pine-knots astonishes and confounds the unsuspecting occupants of the branches over-head. They move to and fro, they flutter, but do not attempt to quit the bushes, seemingly determined to retain possession of their roosting-place regardless of consequences. While one person holds the torch the other is busily engaged in dealing destruction; when in that particular place the ranks of the poor innocents seem somewhat thinned, the killed and wounded are placed promiscuously in the sacks, and in some other part of the roost the former scene is reacted.

Those torch-light excursions yield more than abundance to the adventurers; yet it generally happens that they resort by daylight to the scene of their nocturnal deeds, where they seldom fail to meet with scores of the dead and wounded birds they had overlooked in the hurry and darkness of the preceding night. It is exceedingly strange, that among the thousands of pigeons taken in the manner here described, there never happens, by any chance, to be any old birds! As soon as the second broods are capable of accompanying their parents in their onward journey to the far regions of the north and west, they all as with one accord, leave this section of country; for by this time their favorite food—the beech-nuts—is quite exhausted.

From the Southern Review.

ON MANURE.

Extract from an article on the "Principles of Agriculture," by Professor Thomas Cooper.

By a manure, in popular language, is meant any animal or vegetable substance added to the soil, which will undergo, or which has previously undergone decomposition by putrefying.

More accurately, manures comprehend any addition to a soil, by which it is rendered more capable of promoting the growth of vegetables planted in it.

Hence, a manure may act by altering the mechanical texture of a soil, *in relation to the roots*

of plants planted in it; so as to enable them to take firm hold of the soil for support, or to penetrate more easily into the soil, in every direction that the roots may require. As when clay is added to sand, or sand to clay, to make it more or less adhesive.

A manure may also alter the texture of a soil, *in relation to its capacity for imbibing or retaining moisture.* The hot climate and long-continued droughts of the Carolinas and Georgia, require a different texture in this respect, from the moist and misty climates of Ireland, or the highlands of Scotland.

A portion of clay consisting of one hundred parts by weight, being wetted until no more water would drop from it, was found to have imbibed and retained two times and a half its weight of water: the same weight of chalk (carbonate of lime,) retained one half its weight; and the same weight of silicious sand, one quarter of its weight. These experiments made by Bergman, are cited by Mr. Kirwan, in his treatise "On Manures," (p. 45.) The experiments of Fabroni are to the same purpose. Hence, whether the first mentioned, or the last mentioned intention be required to be fulfilled, clay or marl is a proper manure for sand, and sand for clay, and calcareous earth for both. But the constituent portions of the various earths in a soil, fertile as to its capacity for retaining moisture, cannot be ascertained until very many facts and experiments have been observed and detailed, beyond what we know at present: and in relation also, not merely to the quantity of rain that falls in an average of years on a given place, but to the relative proportion of dry and wet weather on the average of a series of years. Thus, at Stockport and Manchester, in England, the yearly fall of rain will be about 36 inches, according to Dr. Percival, and the number of rainy days may amount to 234 in a year, as a friend of ours has counted. As many cubic inches of rain may fall in Charleston in a dozen days, as in the 234 days of rain in the neighborhood of Manchester; so that the expression of a moist and rainy climate, relates not so much to the quantity of rain that falls, as to the number of days and hours the rain occupies in falling. Fifty inches of rain per annum, with three months of drought, will not constitute a rainy climate.

Probably, five parts of silicious sand, three parts of calcareous earth, or carbonate of lime, and two parts of pure argillaceous earth, would be a mixture that might deserve to be regarded as fertile, as to the view now under consideration. The proposal of General Beatson to manure with clay baked in an oven, or half burnt, so as to be perfectly friable and pulverizable without losing its capacity for imbibing and retaining moisture, seems to us an improvement of no slight importance. Trusting to his description and calculations, we regard the expense as very moderate. So treated, the clay can be ground into a coarse powder, and intimately mixed with the soil which it is meant to improve.

Besides the ways and manners above mentioned, manures may be applied also to *stimulate the living fibres of the plant;* and they may be applied as a pabulum or food, *to nourish the plant.* Hitherto, in all the British publications on manures, they are considered either as acting mechanically, or by their chemical decomposition as affording the substances which are taken up as nutriment. Kirwan, indeed, "On Manures," (p. 48) seems to think that saline substances may act as condiments to plants; and enable them to take up more food. His excepting gypsum, arose from his considering this substance as a septic, a promoter of putrefaction in vegetables; and, therefore, as having no other action than what it exerted on the dead matter employed as a manure. Sir H. Davy, in his fifth Lecture, seems to think it necessary to combat the notion that vegetables are possessed of *life* in the same sense as animals; whose life he seems to consider as emanating from a superior immaterial principle. We shall cite the passage in a note,* and only observe upon

* *Elements of Agricultural Chemistry,* (p. 170.)—"It is impossible to peruse any considerable part of the vegetable statics of Hales, without receiving a deep impression of the dependence of the motion of the sap upon *common physical agencies.* In the same tree, this sagacious person observed, that in a cold cloudy morning, when no sap ascended, a sudden change was produced by a gleam of sunshine of half an hour, and a vigorous motion of the fluid. The alteration of the wind from the south to the north, immediately checked the effect. On the coming on of a cold afternoon after a hot day, the sap that had been rising began to fall. A warm shower and a sleet storm produced opposite effects." [Well: is there any physiologist who denies the effect of heat and cold, upon physiological action? Are not the manifestations of life in the winter-torpidity of cold-blooded animals dependent on these changes?]

"Many of his observations likewise show, that the different powers which act on the adult tree, produce different effects at different seasons. Thus in the early spring, before the buds expand, the variations of temperature, and changes of the state of the atmosphere, with regard to moisture and dryness, exert their great effects upon the expansion and contraction of the vessels; and then the tree is in what the gardeners call, its bleeding season." [And is not the physiological effect of atmospheric dryness and moisture equally apparent in the human frame; in phtisis, in asthma, in rheumatism, in gout?] "When the leaves are fully expanded: the great determination of the sap is to these new organs. Hence, a tree which emits sap copiously from a wound, while the buds are opening, will no longer emit it in summer when leaves are perfect; but in the variable weather towards the end of autumn, when the leaves are falling, it will again possess the power of bleeding in a very slight degree in the warmest days, but at no other time." [Who ever doubted that heat and cold acted respectively as a stimulus and a sedative on the animal fibre?]

"In all these circumstances, there is nothing analogous to the irritable action of animal systems. In animal systems, the heart and arteries are in constant pulsation. Their functions are unceasingly performed in all climates and in all seasons; in winter as well as in spring, upon the arctic snows and under the tropical suns. They neither cease in the periodical returns of their nocturnal sleep, common to most animals, nor in the long sleep of winter peculiar to a few species. The power is connected with animation, is limited to beings possessing the means of voluntary locomotion; it co-exists with the first appearance of vitality, it disappears only with the last spark of life." [Can Sir H. Davy tell us how the partial suspension of vitality during winter in vegetables, differs from the same phenomenon in cold-blooded animals? Have not both the one and the other a vital power of resisting to a great degree, the effects of cold, and of preserving the vegetable and animal temperature unaffected by the atmospheric change? Can Sir H. Davy make the alligator

it here, that a man may be an excellent chemist, and a miserable physiologist; and that his notion of the life of animals being a sub-agent of some governing superior principle, will carry him just as far beyond the bounds of common sense, as of orthodoxy. This is reviving the Archæus of Van Helmont, and the Anima of Stahl. That the superior immaterial principle which is usually ascribed to man, as a characteristic of his species, is common to the whole tribe of animals from the human being to the musquito, the oyster or the earth-worm, is an opinion not warranted by known facts or sound philosophy.

The best account we can give of a vegetable and animal, is nearly that of Mr. Keith, in his *System of Physiological Botany*, (Vol. II, p. 471. London, 1816.)

A vegetable is an organized and living substance, springing from a seed or a germ which it reproduces: effecting the development of its parts by the introsusception and assimilation of *unorganized* matter, derived from the soil by means of the roots, or from the atmosphere by the action of the leaves; and possessing fibres irritable and contractile on the application of stimulus; but possessing no nervous apparatus, serving as the organ of feeling or of voluntary locomotion.

An animal is an organized and living substance, springing from an egg, or embryo, which it again produces; effecting the development of its parts by means of the introsusception of *organized* substances or their products: possessing fibres irritable and contractile on the application of stimulus; and a nervous apparatus, the organ of perception or feeling, of intellect, of moral qualities, and of voluntary motion.

Animal matter can generally be distinguished from vegetable matter, by the strong phosphoric odor which the former does, and the latter does not exhale while burning.

---

and the sea-horse, or the white bear, companions of the same climate.]

"Vegetables may be truly said to be living systems in this sense, that they possess the means of converting the elements of common matter into organized structures, both by assimilation and reproduction." [In the name of common sense what are these but the peculiar and characteristic powers of life? Of life, acting independently in these respects of any law of mechanical or chemical philosophy? Is the production of progeny one of the common *physical agencies*?]

"But we must not suffer ourselves to be deluded by the very extensive application of the word *life*, to conceive in the life of plants, any power similar to that producing the life of animals. In calling forth the vegetable functions, *physical agents* alone seem to operate; but in the animal system, these agents are made subservient to a superior principle. To give the argument in plainer language, there are few philosophers who would incline to assert the existence of any thing immaterial in the vegetable economy"—[no more than in the animal economy of a elephant, or a sponge.]

"Such a doctrine is worthy only of a poetic form. The imagination may easily give dryads to our trees, and sylphs to our flowers, but neither dryads nor sylphs can be admitted in vegetable physiology; and for reasons nearly as strong, *irritability and animation ought to be excluded.*" [Upon this strange assertion, it will not be unfair to observe, that Sir H. Davy ought to have furnished more unexceptionable reasons, in support of an opinion, contradicted by every known botanist and physiologist, during a century past, and universally rejected in the present day.]

It is probable that the decompositions and combinations which take place during digestion, assimilation and secretion, both in animals and vegetables, are results of galvanic action, put in force by the principle of life; but no other power or principle than that of life, can account for reproduction, as the result of the stimulus given to the ovum, the seed or the germ, by the male of every species, both in vegetables and animals. No chemistry of the laboratory, no "physical agency" can explain this.

The introsusception, digestion, assimilation and secretion of food, both in animals and in vegetables, are processes carried on in direct defiance of all mechanical and chemical laws of action, (Sir H. Davy's Physical Agencies,) chemical action takes place and prevails in dead only, not in living matter. The living powers of vegetables and animals counteract and control chemical action.

That irritability, contractility, and increased action, can be produced in the vegetable as well as the animal fibre, by the application of any stimulating substance, is well known to botanists; particularly in the more manifest instances of the mimosa, the dionœa muscipula, the drosera, the cactus tuna, the berberis, the stylidium glandulosum, &c. So, the action of light upon the motion of a plant; the action of heat on the development and maturation of leaves, flowers and fruits; the attraction of distant nutriment and moisture on roots, and above all, the phenomena of impregnation and assimilation, seem to have no more to do with Sir Humphrey Davy's Physical Agencies than they have with the phenomena of a game of chess, or the music of a ball-room. Can any "physical agency" account for the apparent voluntarity that so frequently takes place in the impregnation of the water-lily? Or for the sleep of plants, or the incessant motion of the leaves of hedysarum gyrans? Respect for the well-earned reputation of Sir H. Davy, as a chemist second to no other, has induced us to dwell upon this refutation, perhaps needlessly. We shall, therefore, proceed, and in the course of our reasoning, consider a plant as other botanists and physiologists consider it, a living being.

Manures then may act by *stimulating the fibres of a plant to stronger action.* By inducing them to eat and drink more, and digest and assimilate more perfectly: as when we take pepper and mustard, and salt and wine in reasonable quantity, or quinine, when vital action is languid. Also, by exciting the healthy living fibre to throw off a diseased or dead fibre; as we apply stimulant applications to ill-conditioned sores to excite the healthy parts to slough off the diseased parts.

The substances used that produce this effect, are generally lime, gypsum, salt and soap-boiler's ashes. Hitherto, they have been employed empirically; the point of view in which they are now considered, was hinted at by Kirwan, in a solitary sentence already quoted, and stated at length in Cooper's edition of the *Domestic Encyclopædia;* but no where else that we recollect.

If these substances do not act as forming part of the pabulum or food of the plant; if they do not act by altering the mechanical texture of the soil, there is no other mode of accounting for their action than that now suggested; unless, indeed, we recur to Kirwan's theory of their *septic* power, which is by no means established by ex-

perience in practice, or by sufficient experiments instituted for the purpose. Nor if it were, will it account for the effects produced. We are not prepared or disposed to deny, that these substances, employed in useful proportions, *may* act as septics upon undecomposed manure in the ground; but nothing certain of this nature is yet known on sufficient authority.

They do not constitute the food of plants. Nothing can enter into the composition of a plant, unless accidentally, that is not an essentially component part of a vegetable. We find silicious, aluminous, calcareous earths in plants; we find common salt, gypsum, soda, potash, phosphate of lime and other substances in plants, when these substances are found in the soil wherein the plants grow. But the same plants can and do grow to perfection without them. When these substances are dissolved in minute quantities in the juices which the plants by their roots drink up from the soil, they will of course enter into the sap; and if the vital power of the secretory vessels be not strong enough to excrete them, they will be deposited in the vessels and joints of the plants. As the silicious tabasheer in the joints of the bamboo; as the silicious earth in the straw of the cerealia, and the scowring flag. So, the charcoal of an old tree will very often strike fire with steel; not so the charcoal of a young tree. So, gypsum has been found in rhubarb, and calcareous earth in potatoes manured with lime. So, the salsola sodæ will yield soda near the seaside, and potash, when planted for some time inland. All these instances are manifestly cases of accidental product and the substances enumerated are by no means essential parts of the plants wherein they happen to be found.

I conclude, therefore, that they cannot be considered as pabula. Moreover, the increase in weight of vegetable food from these manures cannot be accounted for from the weight of the manure put on. Thus we were present at the laying out of a clover-field, of which one half was sown with clover without manure of any kind, and the other half was sown with ground gypsum after the clover had just appeared above ground, in the proportion of not quite two bushels, but more than a bushel and a half to the acre. The clover hay from the unmanured part, was a ton and a half per acre; and double that quantity from the portion of the field manured with gypsum. Now, the quantity of gypsum employed, even if every particle of it had been taken up and converted into food, could not have added more than its own weight, or about 120 lbs.; but its effect was, to produce an increase of a ton and a half. So, when lime is strewed on the soil, it remains there; it is not eaten and digested by the plant. Both lime and gypsum also, are manures for more than one or two years. Hence, the increase of vegetation cannot be accounted for from their mechanical action, or from any chemical action, or from their forming any part of the food of plants. As to chemical action, it is none; for gypsum is not decomposable in the common atmospheric temperature; and the lime in a week becomes carbonated by attracting carbonic acid from the atmosphere.

As to common salt, we know too little, experimentally, about it. Mr. Legrand (*Young's Annals of Agriculture*, Vol. V. p. 149) found that so far as sixteen bushels per acre, it was a useful manure; from thence to forty bushels, it gradually destroyed vegetation. Mr. Parke, the chemist, published a letter on the advantages of using salt as a manure, which Judge Peters procured to be republished in Philadelphia, but we know no result of experience on this subject.

Soap-boiler's ashes are a common manure in England; they consist of Glauber's salt, common salt, sulphuret of soda, and various impurities, whose action can only be explained on the suggestions we have just made.

Sea-sand, the mud of salt marshes, and other substances of a saline nature, must be referred to the same explanation. They are all stimuli—they irritate the fibres of the roots—they excite stronger action. The perspiration from the leaves in a clover-field manured with gypsum, is obviously increased, as well as the general vigor and growth of the plant.

Manures may act by *furnishing nutriment to the plant:* as a pabulum or food, convertible into the substance of the plant itself. Nothing can be an essential part of a plant that does not, when decomposed, furnish the substance of which a plant consists. Of what substances does a plant consist? Take a piece of oak-wood, fresh from the tree; weigh it; cut it into small pieces; put it into a glass retort; lute on a glass receiver; and to this, lute on also a bent glass-tube to go under the shelf of a pneumatic trough, and convey into inverted receivers the gases that would otherwise escape; apply fire gradually; distil and receive all the products. First, an aqueous and acid vapor will come over, which may be condensed in the receiver. This is accompanied with an empyreumatic oil, and is, in fact, the pyroligneous acid procured by the gunpowder-makers, when they distil wood to make their charcoal. Then come over gases, viz.: carbonic acid gas, carburetted hydrogen, carbonic oxide and hydrogen. In the the retort, when more products come over, you get charcoal, the same bulk as the wood, and about one-fourth or one-fifth part in weight.* Burn the charcoal, and about one part in 250, by weight, in an old tree, will be ashes; the rest will burn away in the open air, in the form of carbonic acid gas. Of these ashes, part are carbonate of potash, and the rest, earths of the same nature with the soil in which the tree grew. The carbonate of potash in the ashes of oak-wood, amounts to about four pounds in a bushel, or 1-15 part. In hickory they amount to six pounds in a bushel of ashes.

The essential oil of the pyroligneous acid, is convertible by means of a red heat in an iron retort, into carbonic acid and carburetted hydrogen; that is, into carbon and hydrogen.

The acid liquor, which is vinegar, is formed out of oxygen, carbon and hydrogen.

The water is oxygen and hydrogen.

The gases that come over, are chiefly carbon and hydrogen; in the carbonic oxide, a small quantity of oxygen.

The earths are not essential to the plant, either in kind or quantity; and the alkali is about $\frac{1}{15}$ of

* By the experiments of Mr. Mushet, of the Clyde iron works, 100 parts by weight of oak-wood, furnish 76,895 of gas, water and acid; 22,682 of charcoal; and 0,432 of ashes, of which last, we know about 1-15th is carbonate of potash.

$\frac{1}{33}$th, and of this nearly one-half is carbonic acid, which is oxygen and carbon.

Hence, a plant may be considered as composed of carbon and hydrogen, with oxygen in a far less proportion than either.

Suppose we take pine-wood instead of oak: the only difference will be, that from the resin of the pine we shall obtain more carburetted hydrogen by means of a red heat, but the elements of the plant will be the same; and so will it be whatever plant we take for the experiment. In this analysis nothing is lost. The whole plant, decomposed into its elements, is there. Hence, if a plant contain nothing as a uniform and constant part of it, but carbon, hydrogen and oxygen, and about $\frac{1}{1000}$th part of potash, nothing can afford nourishment to a plant; but what is decomposable into carbon, hydrogen, and oxygen, either spontaneously when exposed to the atmosphere, or by the action of the vegetable organs of the plant itself.

It is true, in some plants already mentioned, and which contain gluten and albumen, nitrogen becomes a constituent part; this can be furnished either by the atmosphere, or by animal manure.

We make use of chemical reasoning and chemical terms, and we call in the aid of physiology, because we are not addressing ourselves to the servant who ploughs the ground, but to his master. It is in vain to suppose that the theory of husbandry can be understood by a man who is not well acquainted with the elements of chemistry and physiology. This last most useful branch of knowledge, is strangely neglected in our colleges and universities; although it lays at the root of all physics, of all metaphysics, and of every disquisition relating to the nature of animals and vegetables. The wagon loads of words without meaning, that an accurate knowledge of the elements of physiology would enable us to dispense with, is truly astonishing. But, *à nos moutons*.

Under what forms, when applied, are carbon, hydrogen and oxygen taken into a plant as nutriment?

What parts of the plant does nature employ for the purpose?

Hazenfratz and Kirwan were both persuaded that carbon was the chief pabulum of plants. It is true, that we procure from 20 to 25 per cent. of charcoal, and that the carbon in the condensed liquor, and in the gases obtained, is considerable: but, we should probably mistake, in ascribing more than one-half of the weight of a plant to carbon; the hydrogen and the water (hydrogen and oxygen) will, probably, make up the other half.

Carbon alone, whether applied in the shape of charcoal, coal, or soot, is utterly indecomposable. Sir H. Davy says he dissolved a small part of charcoal in water in a tube hermetically sealed: but the only experiment really worth noticing, is one by Arthur Young, who dissolved charcoal by boiling it in a solution of carbonate of potash; in which form, it was a most powerful manure. I know of no way in which it can become part of the food of plants, but when taken up by the roots in its nascent state of extrication, by decomposition of the substances, fluids, or gases containing it, or by the decomposition of atmospherical carbonic acid by the leaves; which, indeed, is the great source of its supply.

Hydrogen is found in connexion with water, and almost every other decomposable substance acting as a manure, whether producing fluids or gases.

Nor is there any difficulty in accounting for oxygen contained in plants, so abundant on every side are the sources of it.

But let us examine the most usual manures of nutriment.

Stable-yard manure.—As this has been a vegetable before, there can be no difficulty in conceiving that it may become a vegetable again. It has either fermented into the soluble butyraceous mass of the old farm-yard management, or it is employed fresh, and permitted to undergo a gradual decomposition in the soil. In the first method, it acts sooner, and in the same quantity more efficaciously: but this management of a dung-heap, occasions a loss of at least one-half of the nutritious matter, dissipated in the various gases that are extricated, or permitted to run away by the rains falling on the dung-heap. Every such heap of dung should have a covering over it, to preserve it from excessive heat and from moisture.

The great advantage of a long previous fermentation of the dung, especially when mixed with fresh lime, *is to kill the seeds of weeds*, which the mere digestive powers of horses and cattle are unable to effect. In every other respect, the most advantageous and economical use of dung, is to plough it under ground in its fresh and recent state.

Night-soil:—Beyond all doubt the most powerful and efficacious of all manures. It would be no exaggeration to say, that if the economy used by the Chinese, or even by the French and other inhabitants of the continent of Europe, were used in America, at least ten millions worth of produce might be added to the crops of this country. In France, the *fosses d'áisance inodores*, and the dried night-soil sold as a poudrette for manure, are in common use. This substance should be mixed with at least an equal quantity of slacked lime, which takes away all odor, and then, with three or four times its quantity of common earth, and made into a compost.

Mud from ponds—the cleanings of ditches, &c.; Require to be previously fermented to kill the seeds of weeds.

The sweepings of streets are liable to the same remark.

Ground bones.—These contain phosphate of lime, carbonate of lime, and from one-third to one-half of animal gelly fat, and albumen. In Paris, bones are employed in the manufacture of portable soup. The bones are boiled in water to get at the fat and mucilage; and they are digested in diluted muriatic acid for about ten or twelve days; then washed in cold water to separate the solution of lime and phosphate of lime; the transparent gelatine remains in shape of the bone. It is dissolved in boiling water; it is flavored to the palate of the cook who manufactures it; concentrated into portable soup, and so sold.

When young, we attended a veterinary school in London, and a repository of dead horses, at St. John's, Clerkenwell. Let us give the history of a DEAD HORSE. The owner sends him to the currier, to whom he is worth about half a guinea. The currier sends him to the repository,

where he is skinned, and dissected before the pupils who attend, and who pay from a guinea to two guineas a year for the privilege. The currier takes the skin. The flesh is cut off, boiled, and sold to the retailers of cats' meat and dogs' meat, who sell it about the streets of London at three half-pence per pound. The bones being broken and boiled, the fat, when cold, is taken off and sold to the makers of cart-grease for carriages. The bones are then ground by means of a steam-engine, and sold in powder to the farmers, to be used (like soot) as a top dressing for wheat: both these manures containing volatile alkali when decomposed, and supplying nitrogen. The bones contain, after being boiled, full one-third of their weight of animal gelatine, which, undergoing putrefaction and gradual decomposition, becomes a valuable manure. All the bones from the plains of Waterloo, were actually collected and exported to England, principally to Hull. The price of ground bones at that port, about three years ago, was 2s. 10½*d.* sterling per bushel.

The bodies at Waterloo, were first searched over for money, watches, trinkets and clothes. Then came the purveyors of human hair, for the supply of the makers of false hair, wigs, curls and frizettes; then came another class, who extracted from the dead bodies, all the sound teeth, for the supply of the dentists; then, when the flesh had putrefied, the collectors of bones searched the field for *their* harvest.

Frequently, the ground bones, instead of being bought by the farmers for manure, are sold to the manufacturers of volatile alkali and sal ammoniac, for distillation; sometimes, for the hafts of knives and forks, and the common imitations of ivory.

Woollen rags, refuse parings of skins, and other animal matters, having previously been vegetables, are well adapted, by gradual decomposition, to be converted into vegetables again.

Spring crops of tares, vetches, buckwheat, or any other vegetable sown early, and ploughed in, just as they begin to flower, constitute a very judicious mode of supplying manure to the earth, when no other is to be procured. It may be asked, if you plough into the ground the crop which the ground has already nourished, what do you gain? The reply is, you gain the whole of the nutriment that the crop has acquired from the air, and from the decomposition of water: an amount of nutriment, probably, equal to one-fourth, *at least*, of what the plant can furnish by gradual decomposition. This brings us to the question, what parts of the plant does nature set to work to obtain nutriment and supply the growth?

First—The *roots*. There is no evidence whatever, that the roots of a plant can take in any solid matter, or any gaseous matter, unless previously dissolved in water. The sap of every tree and plant, whether ascending or descending, is a fluid; holding in solution more or less of the substances destined to become parts of the plant itself. How does this fluid ascend by means of the roots? Assuredly not by capillary attraction, which would stop at an inch or two; nor by any of Sir H. Davy's "physical agencies," which are utterly worthless to account for the phenomenon. Our mode of explaining it, is as follows: a drop of fluid, containing nutriment, comes in contact with a root fibre in search of nutriment. The mouth of the fibre, that is, the internal sides of the tube, become stimulated; they contract on the drop of fluid, and by a contraction *à tergo*, propel it upwards, where another part of the containing tube being stimulated in like manner, contracts in like manner, and the drop is thus propelled to the very top of its course, in consequence of the irritability of the living fibres of the containing vessels.* In its course, it undergoes the processes necessary to form it into the nutriment, and assimilate it to the substance of the plant. This is done by means of the peculiar organization of each plant, acting as the nature of the plant requires.

Were we to propose a theory, it should be, that the organization of vegetables and animals, includes and arranges a series of galvanic batteries; by means whereof, decompositions and recompositions are effected in organized bodies, which the chemistry of the laboratory cannot explain. We strongly suspect, that when two dissimilar bodies come in contact, electrical effects, chemical effects, and caloric, more or less, are always produced: whenever two dissimilar bodies, with an intervening conducting fluid, capable of acting upon one of them, come together, galvanic effects are produced. And these arrangements are certainly found in every living vegetable and animal. But the view we can as yet take, is not clear: we see as yet through a glass darkly; and, to use the language of the poet, "the present affords but a glimpse through the gloom." However, discoveries are in progress, and in this, as in every other respect, we may cheeringly say of the march of mind, *Ca Ira.*

During the decompositions of the sap, the observations of Gay-Lussac and Thenard, which we see nothing to controvert, will apply. Whenever hydrogen and oxygen unite in a vegetable, so that the oxygen is to the hydrogen in a greater proportion than is found in water, the result is an acid. Whenever they unite in the same proportions that form water, the produce is saccharine, or mucilaginous, or fecula, or woody fibre. Whenever they unite so that the oxygen is in a less proportion than in water, we have resins, oils, gum-resins, caoutchouc, &c. In these cases, carbon forms the third ingredient.

In pine and fir trees, there seems no doubt but water itself is decomposed, and oxygen is given out, during the formation of pitch, turpentine, &c. Is the common prejudice, so prevalent in South Carolina, in favor of a summer's residence in the pine-woods, confirmed by this explanation? It seems so to us.

So much for the function of the *roots*. But the

* We are aware of the theory of Monsieur Dutrochet in his late book, "*L'Agent immediate du mouvement vital dévoilé dans sa nature, et dans sa mode d'action, chez les végétaux et chez les animaux.*"—8vo. Paris; 1826. M. Dutrochet is of opinion that the lymphatic tubes through which the sap ascends, are incontractile; but for no valid reason in support of this doubt that we can discover. If the vegetable fibre be possessed of vegetable life, it must be contractile; this being the characteristic property of living fibre. Nor can his obscure explanation by endosmose and exosmose be satisfactorily admitted, without admitting the contractile property of the cells and membranes introduced in his explanation, nor does the application of galvanism in the experiment of M. Porret, or in that of M. Dutrochet, negative the contractility of the living fibre—especially as those experiments did not succeed with inorganic substances.

leaves also play their part in the business of nutriment. The experiments of Priestley, Ingenhouz, Sennebier, and Woodhouse of Philadelphia, have established the fact, beyond all doubt, that the carbonic acid of the atmosphere, is decomposed by the leaves of a plant, when the leaves are stimulated into action by the light of the sun. This, we suspect, is one of the great sources of the supply of carbon; and of course, a crop ploughed in, adds to the soil as so much gain, all that the leaves have acquired from the atmosphere. But this addition of carbon, induces also from the roots, a greater supply of hydrogen and of oxygen; which would not have been needed, had not this additional carbon been procured by the industry of the leaves. The theory of manure, therefore, by means of crops ploughed in, while in early flower, is supported by all the considerations above suggested.

From the Rev. O. Dewey's "Old and New World."

ENGLISH AND AMERICAN ECONOMY.

I observed that a considerable number of passengers (on board a steamboat) carried a comfortable pic-nic box or basket with them, and spread their own table. With some, doubtless, this provision proceeded from a fastidious taste that feared some poisonous dirt would be found in the common fare of a steamboat. But with many, I presume, it arose from a habit which presents a marked difference between the people of England and of America—I mean the habit of economy. In America we are ashamed of economy. It is this feeling which would forbid among us such a practice as that referred to, and not only this, but a great many more and better practices. In England economy stands out prominently; it presides over the arrangements of a family; it is openly professed, and fears no reproach. A man is not ashamed to say of a certain indulgence, that he cannot afford it. A gentleman says to you, "I drive a pony-chaise this year; I have put down my horse and gig, because I cannot pay the tax." A man whose income and expenses and style of living far exceed almost any thing to be found amongst us, still says of something quite beyond him, which his wealthier neighbor does, "We are not rich enough for that." One of the most distinguished men in Europe said to me, when speaking of wines at his table, "The wine I should prefer is claret, but I cannot afford it; and so I drink my own gooseberry." I have heard that many families carry the principle so far, that they determine exactly how many dinners they can give in a year, and to how many guests; nay more, and how many dishes they can put upon the table when they do entertain.

This frankness on the subject of economy is amongst us a thing almost unheard of. Not that we are more wealthy, but, as I conceive, less wise. The competition of domestic life among us is too keen to admit of any such confessions of internal weakness. We practice economy by stealth. Nor is that the worst of it; for one consequence of this habit of feeling is, that we practise too little. When a stranger looks upon the strife of business in our villages and cities, he imagines that he sees a very covetous people; but a nearer observation would show him that much of this eager and absorbing, and almost slavish, occupation, is necessary to sustain the heavy drains of domestic expenditure. It is extravagance at home that chains many a man to the counter and counting-room. And this extravagance is of his own choosing; because he knows no other way of distinguishing himself but by the style of living. Would he but conceive that he might better elevate himself in society by having a well-read library, by improving his mind and conversation, by cultivating some graceful but comparatively cheap accomplishment, he might live a wiser and die a richer man. Who could hesitate to choose between such a family, and one whose house was filled with gorgeous furniture; where the wife and daughters are dressed in the gayest of the fashion, and the husband and father banishes himself the live-long day, and half the night, from that pleasant mansion, to toil and drudge in the dusty warehouse? He sleeps in a very grand house; he lives in a counting-room!

From the Penny Magazine.

WOLF-CATCHING IN NORWAY.

In Norway, and perhaps in some other northern countries, the following very simple contrivance is used for the capture of the wolf:—In a circle of about six or eight feet in diameter, stakes are driven so close to each other that a wolf cannot creep through, and which are high enough to prevent his leaping over them. In the midst of this circle a single stake is driven, to which a lamb or a young kid is bound. Around this circle a second is formed, of which the stakes are as close and as high as the inner one, and at a distance not greater than will permit of a wolf to pass conveniently, but not to allow of his turning round. In the outer circle a door is formed, which opens inward, and rests against the inner circle, but moves easily on its hinges, and fastens itself on shutting. Through this door the wolves enter, sometimes in such a number as to fill the enclosure. The first wolf now paces the circle in order to discover some opening through which he can get at the lamb. When he comes to the back of the door which is in his way, he pushes it with his muzzle, it closes and fastens, he passes by, and goes the round for the second time, without being able either to enter the inner circle, or to retreat from the outer. At length he perceives that he is a prisoner, and his hideous howling announces to those who have constructed the trap that he is taken, who immediately come and despatch him. It is said that this sort of trap is also used for foxes, and even occasionally for mice.

From the Maine Farmer.

MAKING BUTTER.

In a few remarks on this subject, it is not necessary for us to tell the dairy-woman that it is of the first importance that her milk-pails, pans, pots, churn, &c., should be kept perfectly clean and sweet, for they are as fully aware as we can be, that unless this first grand essential of dairy man-

agement is *strictly* attended to, their whole efforts to produce either good butter or cheese, are in vain. But after all their care and precaution, their expectations are sometimes disappointed—the produce of this labor does not, in quality, come up to what they anticipate, and for what earthly reason they are not able to tell. It appears to them, that no neglect on their part can be the cause—they have been careful that all the preliminaries and the whole operation should be performed with skill, but still they are disappointed—there is wrong management somewhere, but it is beyond their ken to discover it. There are some few facts on this subject, which we have learned from agricultural books and papers, and confirmed by experience, which perhaps are not so generally known as they should be.

That there is a great difference in the milk of different cows, every one of limited experience must have noticed, and that there is an equal difference in cream, and consequently in the butter made from it, is a fact equally apparent to an observer.

If a cow is driven a long distance or driven fast shortly before milking, it injures the quality of the milk, and it will not produce so much or so good cream.

If milk is disturbed after it cools and before the cream rises, it injures its quality and diminishes the quantity. Care should, therefore, be taken to strain the milk as soon as possible after it is drawn from the cow and before it cools. If milk be kept warm for any great length of time after it is strained, the cream will not rise to any degree of perfection. Therefore, the quicker the milk cools after it is in the pans, the greater quantity and better quality of cream will you obtain. Wholesome pure air is also an essential to raising cream in any degree of perfection.

Cream is lighter than milk, and the better the quality of the cream the lighter it is. Consequently, the cream that first rises to the surface, is the best. None but the richest and lightest particles of cream can rise through thick milk; therefore, such milk gives cream of a superior quality, but less in quantity than thin milk. But the milk is better as it retains a portion of the cream in it. The milk in the cow's udder is, in some degree, similar to what it is after standing some time in the pail. The richest rises to the top, hence, the first drawn is not so good, and will not produce so much or so good cream as the last, and should be set in separate pans.

In order to produce a superior quality of butter, the best cream should be obtained, and in no case suffered to stand until it is mouldy, or even until it is quite sour before it is churned. It should never be diluted with water, or made any warmer than the milk was when taken from the cow. When the process of churning is commenced, it should be steadily continued until butter is produced, which should be immediately taken from the churn and all the milk washed out that can be conveniently. If it is sufficiently hard, it is better to free it from milk entirely; but this is not always the case. It should, therefore, be set in a cool place, and worked thoroughly with the butter ladle the next day. Having entirely freed it from milk, prepare a mixture of ground alum salt, saltpetre, and refined loaf sugar, in proportions of three parts of salt to one of sugar, and work in thoroughly one and a half ounces to every pound of butter, and pack it into jars and firkins covered tight; and at the end of twelve months you will find it sweet.

From the Genesee Farmer.

THE TOAD.

There are few animals so universally disagreeable, or which are so generally considered an incarnation of every thing vile, as the toad, *bufo vulgaris* of the naturalist. Milton understood the amount of the prejudice against the toad, when he placed the arch fiend in the disguise of this reptile close to the ear of sleeping Eve, in Paradise; for we may be sure Lucifer would not have been guilty of the indiscretion of approaching her in in that form when she was waking. But though the toad seems to have been marked out for the hate and aversion of mankind, there are few reptiles whose habits are more worthy of notice, none that are more harmless, and few that render more actual service to man. It is true, neither the frog or the toad, particularly the latter, would be an agreeable inmate of the "kneeding trough," or a pleasant companion in the "bed chamber," but in the field or in the garden, they devour multitudes of insects that prey on the labors of man, while they meddle with none of the plants or fruits that require his protection or cultivation.

With the approach of cold the toad retires into the earth, and in a torpid state awaits the return of the spring. If surprised in this state by any change in the face of the earth, that could have the effect of placing him beyond the influence of the seasons, the toad, it is supposed, can remain uninjured in this state for an indefinite length of time; and in this way the discovery of frogs and toads, in deep excavations, and even in solid blocks of stone, has been attempted to be accounted for. The celebrated geologist Buckland, however, seems to doubt whether the evidence in proof of such discoveries, is such as to warrant implicit confidence in the details. We should imagine that if correctly represented, the discovery of the one at Lockport, while excavating the limestone of the mountain ridge, was as little liable to deception or doubt, as such matters usually can be; and we know of no philosophical reason, why, if a toad can lie torpid for one year, as has been proved by burying them in pots, they might not as well exist one hundred, or a thousand, if the proper temperature for ensuring torpidity was preserved.

Some writers have denied that the toad, under any circumstances, was poisonous; but this is a mistake. When in danger, or when irritated, the tubercular elevations on the backs and sides, have the power of secreting a milky fluid, as every one may readily ascertain, and every school-boy who is in the habit of pelting them with stones well knows. This fluid, given for defence, as we suppose, is decidedly poisonous, as its effects on cats, and other animals, fully prove. This is the only power of injuring it possesses; and this secretory and offensive power appears to reside in the skin, as the animal is frequently skinned and sold with the frog in the markets of European cities, for food, and eaten with impunity.

Toads after the time of breeding is over, forsake

the pools of water where they assemble in the spring, and in or near which, they usually pass the winter, and scatter themselves over the land, and when once they have chosen a favorable position, if not disturbed, they rarely quit it for the seasons, and some have been known to retain possession for several years. From these retreats they emerge towards nightfall, or in the evening, and feast on snails, flies, bugs, or any living insect that falls in their way. In a garden their services are thus invaluable; and some gardeners introduce and protect them through the summer, for the aid they render in the destruction of worms, &c.

Notwithstanding his clumsy and ungainly appearance, there are few animals so quick of motion as the toad, and this is shown most distinctly in taking his insect food. It will not unfrequently, in a warm summer evening when doors are open, make its entrance into the house, where it feeds on flies that approach. Seated on its haunches, it surveys the floor with great gravity, but if an unwary fly alights within four or five inches it disappears with incredible quickness. There can be a slight motion of the toad discovered, a quick snap as of the jaws is heard, but the position of the animal is unchanged, while his prey vanishes with the velocity of light. A close examination shows, however, that there is a slight motion of the body forward, without moving the feet; and the snap is produced by the shutting of the mouth after the tongue has seized and secured the insect, though so quick is the operation performed, that the tongue is never distinctly seen. We have often seen this feat performed by placing a fly or bug, on the end of a grass stalk, and pushing it gradually towards the toad when he first makes his appearance at dusk. The lightning's flash is hardly more quick or fatal than the snap of this reptile to the insect he aims at.

To enable the toad, frog, chameleon, and some other reptiles to seize their prey, the tongue has a curious conformation; "it is of great length, its root is attached close to the *fore part* of the lower jaw, while its point, which is cloven, is turned backwards, extending into the throat, and acting like a valve in closing the air passage into the lungs. If, when this animal has approached within a certain distance of the insect it is about to seize, we watch it with attention, we are surprised to observe the insect suddenly disappear, without our being able to determine what has become of it. This arises from the frog (or toad) having darted out its tongue upon its victim with such extreme quickness, and withdrawing it with the insect adhering to it, so rapidly, that it is scarcely possible for the eye to follow its motion." (Roget's Physiology.)

A fact which was related to us a few days since by a gentleman, will furnish a curious illustration of the habits of this animal. He was mowing in a field, when he disturbed a nest of the common humblebee. As they were quite numerous, and appeared very pugnacious withal, he concluded to let them alone until they became more quiet, when he determined to visit the nest again, and appropriate their stores to himself. In the course of a few hours he repaired to the spot, when to his surprise he saw a large toad had planted himself directly before the place of egress for the bees; and he seemed so satisfied with his position that the gentleman determine dto ascertain if possible his business in that place. He soon saw that every bee that showed himself disappeared in some mysterious manner, and that a slight snap, invariably connected with their disappearance, convinced him it was in some way owing to the toad, and that in this way the animal was doing him good service. It was but a short time before every working bee was despatched, not one escaping: and then, by slightly disturbing the nest, the queen bee or drones that generally are found to the number of three or four among humblebees, were induced to venture out, and instantly share the fate of their companions. The honey fell to the share of my informant; the toad appearing perfectly satisfied with his allotment of the "spoils."

From the Rural Library.

TAME RABBITS.

Their profit—fecundity—food—and management —also, directions for building their huts.

1. These little animals are really very profitable; their food costs nothing, and their produce is extraordinary; they will breed eleven times in a year, bringing forth six or eight young; thus at the end of four years a pair of rabbits would produce nearly a *million and a half.*

2. In its wild state it finds warmth and safety by making a hole in the ground, often to a great depth, these holes or burrows branch off, forming chambers where the animal can obtain such a temperature as suits its habits and its young ones.

3. Rabbits of the domestic breed, like all other animals that are under the protection of man, are of various colors, white, brown, black, mouse color, yellow, and speckled of all colors; its native color is brown, but the white with red eyes, and the large black and white spotted, and the yellow, are the most valuable. Tame rabbits are much larger than wild ones, and their flesh very delicate and nutritive—very little inferior to chicken, particularly that of the yellow colored.

4. Rabbits are kept in all parts, and to considerable extent in some places, particularly in England, where there are two very extensive establishments, one in Berks, the other in Oxfordshire; the former feeds white rabbits on account of the superior value of their skins, which are used for hats and trimmings; the latter feeds about nine hundred in huts, or hutches, placed in a building erected and kept solely for that purpose; they make about 36 bushels of dung per week, which generally sells high, being very powerful, two loads is sufficient for an acre of land.

5. The rabbit-house should stand on a dry foundation, on a gentle slope; be well supplied with air, and also with drains and water courses, by which means all rain and moisture is rapidly carried off. Exposure to much damp, whether in or out of doors, is fatal to rabbits; they are like sheep liable to the rot.

6. In large establishments the huts are generally placed in rows one above another, gently inclining backwards, with holes in the hind part to throw off the urine; the lower ones resting upon stands about 18 inches from the ground, for the convenience of cleaning under them. Hutches for breeding rabbits must have two rooms—a feeding and a bed room, with a sliding door to confine them while cleaning. Single room huts

are sufficient for weaned rabbits or bucks, as the latter must always be kept separate; but such for the convenience of cleaning should have a false bottom, like a bird-cage.

7. The floors of hutches should be of hard wood, planed very smooth, that their water may run off, as it is considerable when they are fed on green food; and their troughs should be edged with tin or iron, as their teeth are very destructive to any substance not hard enough to resist them. The troughs should also be narrower at the top than bottom, to prevent them scratching out their food, or dunging in it. Rabbits should be fed twice or thrice a-day. A small hoe and a rough-haired brush, are the best implements for cleaning their houses. When their dung is intended for sale, no litter should be allowed; but when it is to be used on the farm or garden at home, the huts should be supplied with perfectly dry refuse, hay or straw, (not clover,) every day. Their dung, when gathered up, should be kept in a bin out of the rabbit house, as impure air is particularly to be avoided; for where confined in any number, they will not remain healthy without plenty of fresh air. A run abroad for young rabbits is beneficial; but all rabbits must be separated as soon as they are fit for breeding, else they will tear each other to pieces. They are quarrelsome and mischievous animals, and the bucks, when at liberty, destroy many of the young.

8. With respect to form and shape, the short-legged rabbits, with breadth and much flesh are the most hardy and fatten quickest; but these can only be obtained by time and careful selection. There is a large variety called the "*lop-ears*" having much bone, length and depth of body, large ears and eyes, and their flesh is high-colored, firm and more savory than the other varieties; and when cooked like the hare, which at seven months old they nearly equal in size, they make a good dish. The large white, and yellow and white species, have more delicate flesh, and cooked in the same way, much resemble the turkey in flavor. The most fancy sort are the lop-eared "smuts;" they have two, three, or four spots of color on each side the nose, and in proportion to the number and regularity of these spots, there and on its body, so is it valuable.

9. Like poultry, the best breeding rabbits are those kindled in March. The doe will breed at the age of six months; and the time of her going with young is thirty days. The buck and doe are on no account to be left together; but their *union* having been successful, the buck must be directly withdrawn, and the doe tried again in three days, and if she has *kindled* she will refuse him. Some days before bringing forth, hay is to be given to the doe, to assist in making her bed, with the fur which instinct instructs her to tear from her body for that purpose. Biting the litter is the first sign of pregnancy; at this time she will be seen sitting on her haunches tearing off the fur; and on the hay being given she will with her teeth shorten and adapt it to her purpose.

10. They generally bring forth from five to ten; and it is profitable to destroy the weak or sickly ones, if more than five, as that number of healthy full grown rabbits are worth more than ten of an opposite description, and the mother will be far less exhausted; and she will be ready for the buck again at the end of six or seven weeks, when the young may be separated from her and weaned. Much care should be taken that the doe, after she has kindled, should not be approached by the buck or any other rabbit; because if she is harassed about, being of a delicate nature, she will cast her young before her time. If the doe is weakly on her bringing forth, some warm fresh grains, a malt mash, scalded fine pollard or barley meal will warm and comfort her.

11. Due attention must also be given against sudden frost or cold, and particularly damp air; and with the best hay, corn, vegetables, and other food and attention, rabbits may be bred throughout the winter with nearly the same success as in summer. However, they are so productive that one might be satisfied with five litters during the warmest part of the year, giving the doe rest during the months of December, January, and February; as five litters, on a low calculation of five each time, would produce annually twenty-five, which is equal to one thousand from the small stock of forty does. They are seldom good breeders after the fifth year; the buck is fit for use at six months, and is in perfection from one to three years.

12. *Food.*—The art of feeding rabbits with safety and advantage, is to let the principal part of their food be dry and substantial; avoiding weeds and the refuse of vegetables, as such food is too watery and scouring, and can never be an object while the nutritious productions of the fields may be obtained in plenty, and will return a much greater profit. Though rabbits may be kept and fattened upon roots, green vegetables, and hay, yet they will pay for corn, such as oats, peas, pollard, or shorts, and buckwheat; and will always thrive well with an equal allowance of vegetables, such as carrots, potatoes, raw, baked, or steamed; clover and meadow hay, tares, lucerne, cabbage, lettuce, corn-leaves, apples, turnips, parsnips and beets, in fact what they will *not* eat; summer supplies them with a variety of food that may be gathered every where; during winter give them small branches of the green cedar, and small birch and apple brush, for them to eat the bark.

13. The better the food, the greater the weight, quality and profit, which is the case with all animals. Many fatten with grains and wheat bran, (the husk of wheat sifted from the flour,) but the rabbits' flesh being dry, a small allowance of fresh greens is desirable. They are in perfection for feeding from the fourth or fifth month; and it requires two months to make them completely fat and fleshy; but they, like sheep, may be over fattened. Castrated rabbits may be fattened to the weight of upwards of ten pounds; and it is successfully practised in Sussex, where capons are so numerously reared. The operation is performed at six weeks old.

14. In killing full grown rabbits, after the usual stroke upon the neck, the throat should be cut upwards towards the jaw with a small pointed knife, in order that the blood may be discharged, which would otherwise settle in the head or neck. Its flesh is esteemed equally digestible as that of fowls, and of course equally proper for the table of invalids; they are best when young, or middle-aged, and most in season in winter.

15 The rabbit is a caressing animal, and equally fond with the cat of its head being stroked; and not altogether destitute of courage, having been

frequently known to attack the largest cats, and to tear their hair off by the mouth full. The only proper way of holding them is by their ears.

16. *Diseases.*—With due care and regular attention, the rabbit is not liable to disease or sickness, but should any disorder attack them, it is best to kill them. If they become pot-bellied from being fed on watery food, cure: by giving good dry hay and corn, ground malt or peas, or any substantial or absorbent food. Their liver complaints are incurable, and such, if put up to fatten, must not be kept after they have attained a moderate degree of fatness, as they are liable to die suddenly. If dry substantial food is always within their reach, they will seldom require medicinal care.

From the Farmers' Cabinet.

RAISE MORE POULTRY.

Since the time that Esop wrote the history of the country maid and the milk-pail, poultry and eggs have not sold for a better price, or at a greater profit, than they have within these few years. This is believed to have grown out of the immense amount of travelling, which has been increased and promoted by the fleetness and cheapness of railroad cars and steamboats. But whatever may be the cause of it, it is our interest to sell an abundance of eggs and poultry, so long as we can get a good profit by it. I was pleased with the suggestion made by your correspondent Q., in the last number of the Cabinet, for feeding poultry with boiled potatoes, inasmuch as it is a cheap food, and may be always at hand. A farmer near Liverpool, England, keeps a large stock of poultry of various kinds in the same enclosure, with singular success. He has nearly an acre of land enclosed, with a close fence, about seven feet high. Within this enclosure are put up sheds for the different kinds of poultry, to secure them well from the rain, which is of great importance. There is a small stream of water which passes through the lot, to which they all have access, and they are regularly fed, three times a-day, with boiled potatoes, which is their only food, excepting what grass, insects, and worms, they pick up in their movements through the lot.

All young poultry require to be kept dry, and most old ones are the better for it, and it is said that young turkeys, during their tender age, are the better for having a small quantity of red pepper occasionally mixed with their food, to stimulate their digestive organs to greater activity when they gormandize too much.

The practice of cutting up chives, garlic, or onion-tops, and mixing them occasionally with the food of young poultry, is well known to most good housewives, and is thought to be very serviceable in promoting their health. K.

Pequea, Lancaster Co. Pa. June 25, 1838.

ADVICE TO FARMERS.

Judge Buel says, "It has been found that the best and most butter is obtained when the cream is about the temperature of 55 degrees—and if the temperature is over 60 degrees the quality is inferior and quantity diminished. Hence every dairy should have a thermometer."

From the Western Carolinian.

THE FARMER.

Happiness seems to have fixed her seat in rural scenes. The spacious hall, the splendid equipage, and pomp of courts, do not soothe and entertain the mind of man in any degree, like the verdant plain, the enamelled mead, the fragrant grove, melodious birds, the sports of beasts, the azure sky, and the starry heavens.

It is undoubtedly a fact, that in proportion to our population too many leave the occupation of agriculture for other employment. If this arises from its being considered that the employments of the farmer are not respectable, it is a great mistake. Every thing is honorable which is useful and virtuous. This is an employment instituted by God himself, and by him particularly owned and blest. It is that on which every thing depends. True it is laborious; but then labor brings health, is the foundation of the farmer, is the condition of independence; his little dominion is his own, his comforts are his own, and he is not at the mercy of the public whim and caprice. It is not necessarily the case, in this happy country especially, that the farmer must be a stupid, ignorant man. He is taught in his youth the first rudiment of education, and has many spare hours to read. In the heat of the summer's noon, and by the long winter evening's fire, he has much time for his books, and in this country they are placed within the reach of all.

From the Watertown (N. Y.) Standard.

IMPORTANT EXPERIMENT IN PLANTING CORN.

A few weeks since we published a communication from a correspondent, giving the results of an experiment in planting corn, by Hart Massey, esq. of this village. Mr. Massey called upon us on Saturday last to correct an important error in said communication, and invited us personally to examine said field, which we accordingly did, and now give the results of our observation.

Mr. Massey took of the seed corn with which he planted the field, a small quantity, and soaked it in a solution of sal nitre, commonly called saltpetre, and planted five rows with the seeds thus prepared. The remainder of the field, we believe, was planted by the same individual. Now for the result. The five rows planted with corn prepared with saltpetre, will yield more than twenty-five rows planted without the preparation. The five rows were untouched by the worms, while the remainder of the field suffered severely by their depredations. We should judge that not one kernel saturated by saltpetre was touched, while almost every hill in the adjoining rows suffered severely. No one who will examine the field can doubt the efficacy of the preparation. He will be astonished at the striking difference between the five rows and the remainder of the field.

Here is a simple fact, which if seasonably and generally known would have saved many thousands of dollars to the farmers of this county alone in the article of corn. It is a fact, which should be universally known, and is, in all probability, one of the greatest discoveries of modern times in the neglected science of agriculture. At all events, the experiment should be extensively tested, as

the results are deemed certain, while the expense is comparatively nothing.

Mr. M. also stated the result of another experiment tried upon one of his apple-trees last spring. It is a fine, thrifty, healthy tree, about 25 or 30 years old, but has never, in any one year, produced over about two bushels of apples; while in blossom last spring, he ascended the tree and sprinkled plaster freely on the blossoms, and the result is, that it will this season bear 20 bushels of apples. Now if the plaster will prevent blast, it is a discovery of great importance. Mr. M. was led to make the experiment by reading an account of trees adjoining a meadow where plaster had been sown at the time there was a light breeze in the direction of the orchard, the trees contiguous to the meadow bearing well, while the others produced no fruit.

ON THE GREAT RAFT IN RED RIVER.

To the Editor of the Farmers' Register.

* * * * * * * *

I do not possess as accurate information about the great raft in Red river as I ought, to justify as minute a description of it as you wish; but I give the best I have, only warranting it to be substantially correct.

The raft is an obstruction of fallen trees and logs, that have entirely reached from one bank of the river to the other, and firmly fixed in its bottom and sides, and has, with intervals of unobstructed or open river, occupied a space of from 130 to 150 miles in extent. Over this space, in a thousand places, a foot passenger can cross without wetting his feet, and see the slow current below him. About one half the river has been filled with alluvion, on these logs, which has given growth to a dense mass of cotton-wood and willow trees, of various sizes, forming a shelving bank, that will never be removed by the current. The future river will be the inroads made by the engineer, and the current of the stream, on the other bank of the river. The great business of the engineer has been to enable the stream to clear itself out. When the country was first occupied by the whites, the raft was about 150 miles above Natchitoches, and about 20 or 30 miles below the bayon or outlet of Lake Bestineau. At this bayon Capt. H. Shreevé, the U. States' engineer, commenced his operations, about five years ago. The raft once formed, of course stopped all the drift-wood, and increased from 1 to 3 miles a-year, according to the number and heights of the annual freshets, and decreased below about half that space. The growth of a rich swamp being generally sappy woods, were rapid in their decay, subjected as they were, by their position, to be alternately wet and dry; and as they decayed, were loosened and carried off by the current, which made it again an open river. This accession above and secession below have perhaps been going on for ages. The unequivocal remains of the raft, in low stages of water, may be seen in numerous places several hundred miles below where it lately was, and some nearly as low as the disemboguement into the Mississippi. The original formation of the raft may probably be attributed to one of the following causes. The Red river is a stream of immense length and great depth, compared with its width, and is very crocked; its soil a very fine sand, with a pure vegetable deposit; its length exceeds 1500 miles; its depth averages from 15 to 20 feet, and its width about 200 yards, as near as my eye-sight enabled me to judge. The swamp shows that the river has frequently changed its channel; and this, at some distant date, may have occurred on the rising of some great freshet making a new channel, which has been choked by the falling in of the timber from both sides, coupled with the drift-wood. Once stopped, all the other consequences are very natural. Another cause, and more probable, may be that the Mississippi, receiving its waters from points more distant and much higher up the country, raises it higher, and backs the water up all its tributaries below the Missouri from 20 to 50 miles. I have passed up and down the Red river when it was so backed up, and showed little or no current. The drift-wood must accumulate at these places in immense quantities; and you can easily suppose how probable it would be for 2 or 3 miles of drift-logs, with their roots and limbs to them, intersecting each other, all seeking to pass out at the same time, as the Mississippi should fall, would reach from side to side of the river and lodge, and the press of the upper logs would make the jam complete. I give the above as the probable causes. They are entitled to no more respect than as they may be correct deductions from the facts above-stated. The raft once removed will never form again where the river is open to its proper width. If it should be, by the back-water of the Mississippi, it will be at a point below where 50,000 bags of cotton now have to pass to market, and will be removed before it can have time to form into any material obstruction, within the upper part of the raft, where the river has no one current half its proper width, in its present state of clearing itself. Such an event is very probable, and the engineer, two years ago, communicated to the war department such probability, and a steamer has been built, to remain a year or two, till the river clears itself to its proper width.

The effects produced by the stoppage of the usual passage of so large a body of water, and that swelled to more than double the amount by the periodical annual freshets, as was to be expected, have been very great. Immense bodies of fertile lands have been overflowed, large lakes have been formed, (now navigated by steamboats,) such as Lakes Bestineau and Caddo, or Soda; and large rivers or outlets created, which, so soon as the river is compelled by man to return to its accustomed channel, and shall have worked out a depth equal to its depth above and below, will be restored very much to their former condition. I think it probable that in ten years, fine crops of cotton and corn will grow on the bottom of those lakes, now the tract of the steamboats, and fifty thousand acres of the richest land will be redeemed from nearly a perpetual overflow. The raft region, for the space of near 500 miles, presents generally two streams or outlets and inlets, as the upper bayous that create lake Bestineau on the east, and lake Caddo on the west. Where the Caddo waters, come in, just above Shreeveport, the river is large and fine, but soon expands into the Bayon Pere; and where that comes in, it again expands into the Bondieu, again coming in near Alexandria; and they each carry as much water

as the Red river. The Bondieu is now the river of navigation, carrying two-thirds of the water, and threatens in a few years to throw a bar across the Red river, and make Natchitoches only accessible in high stages of water. The steamers now go to Shreeveport, 100 miles within the late raft, in stages of water that compel them to leave their freight for Natchitoches four miles above the town. Such have been the effects of the raft, and some such as I have ventured to anticipate, will be the effect of its removal. The river, both above and below the raft region, has but one stream, and that a noble one; and it has been the object of the engineer who directs the work, to make it but one through the raft.

The modes of removal have been as various as the differences in the situation of things. The object has been to do more than to enable that powerful agent, the current, to clear itself out; and so formidable have been the obstacles, and so various in their character, that it has required all the skill of the engineer, with the aid of strong natural talents, and the possession of a great share of that uncommon quality, called common sense, to overcome them. Such a man the government has found in Capt. Shreeve. One of the most usual modes of work has been to place the laborers on the raft, who saw all key logs, or such as seemed most to confine others to their places; and when so prepared for dismemberment by their previous cuts, the cables are fixed to them by iron wedges at their ends, driven into the logs, and the steam is applied, and large masses are pulled away. These logs are turned over to other boats in the rear, that cut off the stump-ends, and where the branches put out; and the logs, so deprived of roots and branches, float on the surface without the danger of tangling or holding on to each other, and are passed out by the current, in times of high water, through the Mississippi into the ocean. The snag-boat comes in the rear, removing the snags or other logs too firmly fixed for the first pull, and runs directly on the snag, and where it does not break out, it is fastened to the chain and pulled out with ease.* The power is, perhaps, the greatest now used in America, and can in a few minutes uproot the very largest trees, and drag them from their residence. The diameter of the wire of the chain is $1\frac{1}{4}$ inches, and each link weighs upwards of 15 pounds; and the power is such that the tree must come, or the chain will snap. It has been equal, so far, to remove every thing to which it has been applied. A cotton wood tree, 40 feet long, by 5 feet diameter at the but, three or four feet under the mud, has been one, if not the greatest, of the applications of its power that I have seen.

The larger portion of the logs are used to fill up all the material outlets of the main stream, and the old river, whenever a new one has been made by a cut-off. There is no danger of their being returned by high-water into the main river again, as it is the uniform operation of the master stream to fill up the mouths of all its outlets whenever the current in them is materially checked.

Another usual mode of work is to cut all the trees from islands and wearing points of the banks, and remove the wood; and the stream so aided will remove the earth.

Another mode is to cut off, occasionally, large bends in the river, whereby many miles of raft have been saved the clearing by a cut of 100 yards. When the freshet enters these cuts or canals, the sides fall in, and dissolve like sugar; and 24 hours gives you a new river. These cut-offs save labor, improve the navigation, by increasing the current, and furnish a convenient depository for drift-wood. These, with occasionally making dams across large rivers, where you could not otherwise materially check the current, constitute the principal modes of applying labor.

The operations of the first year cleared upwards of 100 miles of the raft, in consequence, as I have said before, of the logs being very much decayed, and to that distance, that is to Shreeveport, there has been for some years, and now is, an excellent steamboat navigation. The difficulties above that place have been very great indeed, and have occupied all the time since, till May last, when they were removed, so as to give passage to steamboats 250 miles above the raft to Fulton, Fort Towson,&c. About half a dozen boats have been plying regularly between New Orleans and these places since that time. A steamboat, with a few hands, will have to remain in the raft for a year or two, to prevent the creation of new obstructions from the banks falling in, while the stream is working out a sufficient passage for itself. When this is done, the river, like all others, will take care of itself, and will furnish a safe and convenient high road to market of the products of what, from all I have seen, I would say, is the finest cotton country in the United States.

A PLANTER.

---

* The snag-boat is a steamboat, the invention of Capt. Shreeve, open at the bow down to the water's edge, with two large vertical wheels on the same shaft, over which an immense chain is passed, and this lever operated on by the water wheel shaft. The snags are run into this aperture at the bow, and so made fast for the levers to act on.

A FIRST TRIAL OF SILK CULTURE.(*a*)

To the Editor of the Farmers' Register.

Diamond Grove P. O. Brunswick, Va. Aug. 11, 1838.

I promised to give you an account of an experiment I made, last spring, in the culture of silk. I shall not attempt it in detail, but merely give the result. The eggs commenced hatching about the 1st of April; and having then but little confidence that the placing them on ice would retard the process, and the cocoonery I was then building not being ready for the reception of the worms, I was forced to crowd 50 or 60,000 on two shelves for a week; instead of which every day's hatching should have been kept separate and distinct. So many different ages having been mixed up together, made the labor much greater about the time of spinning.(*b*) If possible, all on a shelf should spin at the same time. I determined, however, to try an experiment of about 30,000 eggs, by putting them in a tin box, and placing them directly on the ice, which was done after many had hatched. They were kept on the ice ten days, and then taken out, and in a few days they hatched out fully as well as the first. I supposed I fed in all 90,000 worms, and not having a sufficiency

of the *morus multicaulis*, or Chinese mulberry leaf, at that time, I made use, in part, of leaves from our native black mulberry.* The worms remained quite healthy, until I supposed eight-tenths had spun excellent cocoons. The leaves of the common mulberry became scarce. I had to send three miles for them; and the weather being then very warm, I found it impossible to get them to the cocoonry before they became heated and dark, which caused disease amongst the remnant fed with the native mulberry. Some died; and those that spun the cocoons were not as perfect as they should have been. Those fed with the Chinese mulberry leaf remained healthy, although the shelves were within a few feet of the diseased ones. The nursery of the Chinese mulberry being convenient, the leaves were used fresh from the tree, or placed in the cellar before they became warm, and sometimes remained two or three days in good order. I think that worms fed with the leaves of the Chinese mulberry, are not as subject to disease as those fed from our native trees. If fed with the former, they consume every part of it; but when the leaves of the latter are used, they refuse a large portion, which, if allowed to remain on the shelves, will certainly produce disease.(*c*) The labor saved in gathering the leaves of the Chinese mulberry being so considerable, I have no doubt it will supersede the use of all others. Some have calculated this saving of labor at nine-tenths, and, I think, are not far out. I have weighed 150 lbs. of cocoons, which I am now reeling. One of the hands gets half a pound of raw silk per day. The reeling is done on a reel I had built at home, after a model I purchased last summer, in Hartford, Connecticut, for five dollars; and I think they can be made for three dollars. I have no doubt they are equal to the patent reels, so much puffed at the north. I can see but little difference in the strength of the silk made from the two different kinds of mulberry; except that made with the Chinese has a lustre, which gives it a superiority. I made but one crop this season. I have no doubt that three crops can be made; and I should have attempted it, if I could have procured the eggs. The hands I had employed were double the number necessary. My object was to instruct them in the business, so as to be ready for a much larger crop, another year. One of the hands, after attending the worms two weeks, could have managed half I fed in the usual way. It is quite a mistaken notion with some, that slave labor will not answer in the culture of silk. I had some white hands employed; but I also had some blacks, who were little inferior to the best white laborers, and are now reeling excellent silk. One of the black hands, now only eight years old, I found very useful in feeding worms, and can now reel well. I have no doubt, much of the labor I bestowed was unnecessary, as the business was entirely new to all employed. The cocoonry I had built is 40 feet by 24, and 16 feet pitch, well fitted up with shelves, on the most approved northern plan. The house should be well ventilated, to admit the air freely through, or the worms will certainly become diseased. I have no doubt that a house built of logs is equal to any that can be fitted up; and the barns now used for tobacco can easily be converted into cocoonries. I have 30,000 *morus multicaulis* or Chinese mulberry trees, and a nursery that will afford from 80,000 to 100,000 cuttings this fall. Should the silk crop fail, (for which I have no fears, being so fairly tested,) I would certainly plant an orchard of the Chinese mulberry trees, for the purpose of feeding stock. I find both horses and cattle remarkably fond of the leaf, and I think we have no coarse forage possessing more nutriment. I think an acre of land planted in mulberry trees, will produce as much in weight, (the leaves being easily cured,) as our best grass meadows, in the southern and middle counties of Virginia. The trees will yield several crops of leaves in one year.

I commenced, like most others, with too great a number of worms, before I had a sufficient quantity of leaves, and but little knowledge of the business. From 5,000 to 10,000 are fully sufficient to commence with. The worms, in the 4th and 5th age, eat an incredible quantity of leaves; and if they are not fed plentifully, it prolongs the time of spinning, and, therefore, increases the labor. One of my neighbors fed but few worms, and they commenced spinning in 25 days; while mine were 40 days before a cocoon was formed.(*d*) Taking every thing into consideration, I think the crop a fair one, and am willing to try three crops next year.(*e*)

I shall have more trees than will be necessary to carry on the business next year, and am willing to dispose of part of my stock.

THOMAS HICKS.

* *Morus rubra.*—ED.

Notes, by the Editor.

(*a*) It is with much gratification that we have received, and present to our readers, this account of a first, and therefore imperfect, experiment of silk-culture in Virginia. The writer's locality is precisely that which offers the strongest inducements, and promises the highest profits, for this business; and we feel assured that he will so correct his first (and always inevitable) mistakes, as to be able to prove, practically and satisfactorily, the soundness of the position which we have long ago assumed, and again recently asserted, that whatever may be the profits of silk-culture in the northern states, they may be far surpassed in Virginia, by applying equal skill, care, and industry, to the superior advantages of our better climate, and cheaper land and labor. The interest which we feel in this subject, and the value attached to the experiment and labors of our correspondent, will induce the making some remarks and strictures on parts of his communication; which, for convenience, will be appended in the form of notes to the passages referred to.

(*b*) The keeping together worms of different times of hatching was a very great error, and must have caused loss, and injury to the worms, in all their different "ages," or times of moulting, by the difference of time in which they were commenced and ended, as well as the injury found at the time of spinning.

(*c*) The bad condition of the leaves of the native mulberry, used for the latter worms, was sufficient to account for their being less healthy food, and producing inferior silk, to the Chinese. It will require a much more careful and fair experiment than this, to establish the fact, that worms may not be kept as healthy, and

made to produce as much, and perhaps as good silk, on the native mulberry, as on the Chinese; though there are still enough of superior advantages in the latter kind, in other respects.

(*d*) The prolongation of the time before the worms begin to spin, whether caused by scant feeding, want of warmth, or any thing else, is doubtless attended by loss in more respects than the mere additional food thereby required, and the labor of giving it. The health and vigor of the insects must suffer, and the quantity of silk finally produced by each will be less. A comparison of his cocoons which were not formed before the worms were 40 days old, with those of his neighbor, which were begun at 25 days old, would probably have shown the superiority of the latter.

(*e*) We fear that the attempt at three, or even two crops of cocoons in a year, will not succeed, except to the great injury and destruction of our correspondent's young mulberry trees. At least, we would advise his making, at first, but a small experiment of double or triple crops; and the second or third feedings to be confined to a certain portion of his trees, so that the degree of injury may be observed, and properly estimated.

From the Farmer and Gardener.

COB-MEAL AND COB-MILLS.

A friend and correspondent in Ohio has requested some information as to the value of cobs ground with the corn, and the cheapest and best mill for grinding them together.

That a very great saving is effected in feeding animals by grinding their food does not admit of a doubt; and the explanation of the fact, as given by Raspail and Dutrochet, is perfectly satisfactory. It is also certain that when nutritive matter is properly divided and incorporated with some substance suitable for the action and distention of the stomach, that a much less quantity will suffice, and the animal be in equally good condition.

It is on this principle that the English custom of substituting cut straw for hay in feeding with grain, a saving of one-half of the expense being made by feeding with cut straw and ground grain, over feeding with hay and unground grain, according to the old mode. Neither the straw, or the cob contain any great amount of nutriment in themselves, but they assist the digestive functions, and render the accompanying nutriment more available. The cob however has much the advantage of straw in every respect; and experience shows that those lose much who waste this important part of the corn crop.

Some interesting experiments have been recorded, in the N. E. Farmer, on the subject of fattening animals on corn and cob-meal. The Rev. Mr. Perley in describing his method of using the food says:—

"I have for several years practised having my corn and cobs ground together; breaking the cobs fine by pounding, and grinding one peck of corn with a bushel of the cobs. Meal made of this composition, I scalded, and made about as thick as common hasty pudding, or mixed about one peck of the meal with about three pecks of boiled potatoes, thickened to the consistency of pudding. There were no hogs in the neighborhood grew so fast, or were fit to kill sooner in autumn."

In the Massachusetts Agricultural Repository is a communication from Mr. Rice of Shrewsbury, in which he says:

"The very best provender I have ever used for fattening cattle, is corn and cobs, ground together. The reason I consider the cob useful is, it swells in the creature, and keeps him in good order; in no one instance since I have fed with this meal, have my cattle been out of order by being cloyed, or scouring; they are at all times regular; but when I formerly fed with clear Indian, or oats and Indian, these difficulties frequently occurred, and they would lose as much in two or three days, as they would gain in a week. The second year that I made use of this kind of provender, I thought I would try an experiment, by feeding one ox with corn and oats ground, the other with corn and cobs, having one yoke oxen so equally matched that no one who viewed them, appeared satisfied which was best. The cob is computed to make a little more than one-third, therefore I mixed the other with one-third oats, which was my former mode. I gave each ox an equal quantity at a time, except that the one which had corn and oats some days became dainty, and would not eat his allowance; while the one fed with cob-meal kept on his regular course. When taken to market and slaughtered, the oxen weighed 28 hundred and a half, the one fed on corn and oats had 162 lbs. of tallow, and weighed about half a hundred more. The one fed on cob-meal had 163 lbs. of tallow, and the butcher pronounced his meat half a dollar in the hundred better than that of the other."

In the third vol. of the Philadelphia Society for promoting Agriculture, is an excellent paper by Dr. Mease, in which the utility of grinding the cobs with the corn is clearly shown, both from analogy and actual experiment. And we believe that wherever it has been tried, or wherever the means of grinding can be had, it has been approved, and will be found of great value.

So far as we are acquainted, cobs after being broken, are ground in the common millstones with the corn. The same machinery used for grinding plaster of Paris or gypsum, has been found efficacious for grinding cob-meal; the plaster cracker reducing the cob sufficiently for the action of the stones. Mr. Buckminster, speaking of machinery for this purpose, says,—"for making cob-meal we placed in our mill a pair of large stones, cut the eye of the runner 12 inches at top, and 14 or 15 inches at bottom, and bosomed it out large, as we term it. In this manner it answers every purpose for grinding and cracking corn in the ear."

The cast iron bark mill has been used for cracking cobs to some extent, and where a mill is convenient to grind the cobs and corn after cracking, would answer a good purpose; and we can see no reason why one constructed on the same principle, and like those worked by a horse or water power, might not be constructed to reduce the cobs and corn sufficiently fine to answer instead of the ordinary process of grinding. It must be remembered, however, that the goodness of cob meal must always in a great measure be dependent on its fineness. Where it is an object to provide a mill of this kind, any farmer who has a horse-power

thrashing machine, may with little expense procure ordinary millstones, and by attaching a cracker as for a plaster mill, or arranging the stones themselves as recommended by Mr. Buckminster, have a mill not only useful for grinding cobs but all the grain he intends for feeding. As the power required would be lessened as the velocity was decreased, two horses would run a pair of millstones, it is believed, with as much ease as four do the larger thrashing machines.

From the Franklin (Ky.) Farmer.)

MANAGEMENT AND DISEASES OF HOGS.

To Chilton Allan, president of the Kentucky State Agricultural Society.

I have seen in a late number of the Franklin Farmer, your circular address, calling upon the friends of improvement for essays upon a number of important subjects relating to the agricultural interests and pursuits of our state. Approving heartily the noble objects of the State Society, I read your address with great satisfaction; and I cannot but believe, that the action of the Society will bring about the most gratifying results in improving the science of agriculture, and hence the condition of the husbandman: for I cannot doubt, that every one who desires improvement himself and who would derive useful information from others will hold himself bound to contribute something to the general stock of knowledge. There are few intelligent farmers who do not know something unknown to others, and it is by an interchange of sentiment and opinion, as well as of experience and practice, that the farmers of the country will be able to see and reject the errors of their husbandry and adopt those modes instead which lead to improvement and success. In this view, I offer an humble tribute, which at least has the merit of a well meant design of benefiting others in some respects.

The commencement of our prosperity may be dated from the period when our agriculturists turned their attention to the raising of stock for export; and as the consumption and demand have increased in a ratio with the increase of population and wants of the people of the United States, the business has become a source of wealth to Kentucky. And no where has the improvement of stock been so great and so general, nor more zeal and perseverance manifested to procure the breeds of horses, asses, cattle, sheep and hogs. In enumerating these descriptions of stock, the last is not the least important in bringing wealth to the state, and should be looked to with a fostering care and attention.

Under this belief, I humbly submit to the public through you, the following observations on the management of hogs, with some remarks on some of their diseases.

In giving my views on these subjects, I deem it important to state some of the various ways of raising, feeding and fattening hogs in different sections of the country, which, according to circumstances, soil and climate, will differ; and conclude with my views as to the best mode to be adopted by the farmers of Kentucky under her peculiar circumstances. In Europe and many parts of the United States, hogs are indispensably kept in pens or sties, and as the numbers raised are comparatively small, there is no great expense attending the manner of feeding them; indeed this is the most economical, cheap and convenient method of fattening that could be adopted in any country where the number fed is small. In some of the New England States large buildings have been erected for raising and fattening hogs on an extensive scale, fed almost exclusively on vegatables produced on a few acres of land, which gives a profit of 50 per cent. more than any other way in which the products of the land could be disposed of. On this extensive scale, the business is unconnected with any other, having for its object the raising and fattening of hogs alone, for it requires the most strict attention which daily habit and the most scrutinizing observation, in time reduced to a perfect system, can give. It was ascertained to a fraction, what each hog would eat at a meal, which was measured out to him three times a day, the quantity according to age, allowing six of the same age to occupy a sty, which was regularly littered and cleaned out once a day. The amount of vegetables required per day, and the necessity of the different varieties coming on in due season, would require great attention. At the first view of the subject, we would conclude that a piggery conducted in like manner in Kentucky, would be equally profitable. But not so—there would be this difference:—The price of pork and lard in Boston is more than 50 per cent. higher than in Louisville: and the profit accruing from the superabundance of manure, which is worth from two to three dollars a load in the New England States, will amount to a large sum, which with us would be excluded from the estimate, as it will bring nothing here on sale, though useful to the land on which the hogs are fattened. In 200 hogs annually sold, these causes would produce a difference of perhaps three thousand dollars in favor of the New England piggery.

Say 200 hogs at 200 lbs. each, 40,000 lbs. pork at 10 cents in Boston,	$4,000
For their manure,	1,000
	$5,000
40,000 lbs. pork at Louisville, at 5 cents.	2,000
Leaving a difference in favor of the New England piggery,	3,000

In no way could an extensive piggery be made profitable to us but by being connected with a distillery. The expenses would then be much lessened; for it would require but a few vegetables or little meal added to the slop of the distillery to make the swill highly nutritive. They might be put to graze in the summer and swill given them occasionally and again put in the fall.

The manner of feeding and fattening hogs now generally adopted in this state, seems to me to be well calculated for our method of cultivation. Taking into consideration the products and the great number of hogs fatted for other markets, together with a great number of beef cattle annually grazed and fed, the system is complete. In winter, they are amply supplied with food from the refused corn and pudding of the cattle—two or three hogs to each head of cattle finding thus abundant sustenance. In the spring, when the

cattle are no longer fed, the hogs are put on the exuberant clover field, which was sown for the double purpose of enriching the land and supplying rich food for their cattle and hogs. In due time, when the clover becomes hard, and unfit for the hogs, it is given up to the earth, and they are removed to the rye fields, there to fatten and complete another system of manuring, so admirably adapted to our lands and our wants. So soon as the rye field is consumed, the corn field is ready to receive them,* and in due time they are ready for market, leaving the fields and pastures richer than they were.

Although this arrangement is good for feeding and fattening, yet there are other important matters in relation to their raising and health, which in no wise should be neglected. Experience has taught me, that no matter how many pigs a sow has over six, they should be reduced to that number, always retaining the large and healthy ones; for I can, and will demonstrate, that six pigs will make more pork at 12 or 18 months old, than eight would of the same litter—and eight will make more than ten. Give to the six the food which you would give the eight or ten, and you will find in the result the truth of my statement proven. It is essential that pigs be kept fat while sucking, and to have them so, six is a better number than eight or ten. At weaning time or when sixty days old, the time when the sows decline in milk, particular attention should be paid to the pigs, having them regularly fed either with corn or swill, for at this juncture, they are unaccustomed to *root for themselves*, and will rapidly lose their flesh and their health, and their growth will be retarded, if left to shift for themselves. If they are kept fat during the fall, when provisions are plenty and cheap, they will keep thrifty and well through the winter, on very moderate feeding; but I prefer liberal feeding throughout. The food is by no means thrown away, as you will have more pork and not any more corn consumed in the end.

Hogs should be kept free from diseases; particularly the disease of worms, which is very pernicious and a constant attendant on poor hogs. Liberal feeding at all times, is the best preventive, *but when it is not in the crib*, brimstone, spirits of turpentine, or tar mixed with their food will remedy the evil. All hogs are more or less subject to worms; but some are so overcharged, that their intestines are literally filled with them, and unless they are extirpated, it is throwing away corn to feed them, for in this condition it is almost impossible to fatten them; they will consume twice as much as a hog will not troubled with them, as the nutritious juices are taken up by the worms, and their fetid excrement is all that is left as a miserable substitute for sustenance.

The most fatal disease of hogs is the swelled throat or quinsy. This too, is easily prevented. I have long been of the opinion that it proceeds from indigestion, caused by feeding on hard grasses or clover in their declining state; and my successful practice as a preventive for the last eight years is a strong confirmation. Yet it matters not concerning the cause, provided there is a remedy. The disease in the last stage, is highly inflammatory, but at no time infectious. It is an accumulation of matter formed between the glands of the jowl, which continues to inflame till the hog dies of suffocation. The disease may be cured before and after the matter begins to form; but as it may be more satisfactory to state my experience and knowledge on the subject, I will give an instance as coming under my observation, and conclude with my practice as a cure and preventive. In 1830, I discovered the disease among my hogs by the death of one of my fattest. As soon as possible, I had them removed from the clover field, and put in a spacious pen, where they were fed with as much corn as they would eat after it was glazed with tar and as much ashes put on as would adhere to the grains. They still continued to die till I lost to the number of fifteen. This great number dying out of eighty, caused me to doubt the efficacy of the remedy, or that the disease was too rapid for its effect. Shortly after, they were put up to fatten, which they did very readily, and I was left in doubts as to the effect of the medicine, until the day I butchered, when I found lumps of coagulated matter in the jowls of many, about the size of a hazelnut or larger, without any signs of inflammation around them. I then came to the conclusion that they would have died had it not been for the remedy applied, and that the disease of those that died had advanced too far to be cured by any remedy. Observing that hogs kept in sties never had the quinsy, I attributed it to the wholesome quality of food they ate, and on the contrary, the cause of their having it out of sties, to the pernicious qualities of hard dry grasses. Since 1830, I have invariably given my hogs, during the spring and summer months when grazing, slop or swill once a week or oftener, consisting of kitchen slop with cooked vegetables of various kinds, apples, &c., with bran or a little meal, mashed to a paste, salted and cooled off by adding a quantity of water, and occasionally brimstone or saltpetre. Since the above date, my attention has been directed to the raising and fattening of hogs on the products of a small farm, and I have never yet lost a hog by this disease, nor in my recollection by any other. My opinion is still further supported as to the cause of the swelled throat, by its being less frequent since the practice lately adopted in putting the hogs to graze when the clover is young and tender, and taking them off when it is old and tough.

Every body knows that the young and old hogs should be kept apart in winter; and yet how shamefully this important matter is neglected by many. Young and old, great and small are crowded together, day and night, mashing and smothering; and yet many will look on with heedless regard at the great destruction of their young stock, without separating them. When young and old are fed together, the old will always get more than their share, thereby the young become poor and diseased, making little or no progress in growth.

* We presume our writer does not intend to be understood, that the hogs are turned into the corn field; for though this practice may be adopted by some, the more general custom is to put them in a large pen adjoining, into which the corn is thrown. If the corn is not sufficiently ripe when the rye is consumed, old corn is fed to the hogs; and indeed, the feeders generally, we believe, prefer beginning to feed them on old corn after they are put up—introducing the new rather cautiously and gradually.—*Ed. F. Farmer.*

The breed of hogs best calculated for our general purpose is yet to be ascertained. Within a few years, great exertions have been made, at considerable expense, to procure the best breeds, but whether any of them answer our expectations, I think very doubtful. The breeds imported here, were improvements made to suit the purposes of others under different circumstances, different soil and climate, different food and management, and under a different method of disposing of the pork, and according to our present mode of farming; thus differing from the methods abroad, whence these hogs have been brought, and our surplus pork being chiefly driven to the south, I think ultimately they will not do except in the event of the successful completion of the railroad from Lexington to Charleston. Then the smaller and earlier matured hogs, the Byfields, the Berkshires, the Bedfords, &c. will be more profitable than the larger breeds. But should this all-important improvement to the west prove abortive, the hog that will be best calculated for our interests, is yet to be improved by some judicious cross from our present great variety of breeds. The fat varieties, as the Bedford, Berkshire, &c., from their early propensity to fatten, are best for family use and home consumption; but owing to their incapability to travel, they must measurably give way to the longer-legged hog, until the railroad from Lexington to Charleston is complete.

BIRD SMITH,
Member Ky. State Ag. Soc.

From the New England Farmer.

VALUE OF MANURE.—INTERESTING EXPERIMENTS IN FARMING.

James W. Thomson, M. D., Cor. Sec. Ag. Society:

Although I am not what might be called a practical farmer, not having had the time to devote to it that I could have wished, yet having done something in that line for a considerable number of years, I feel a freedom in submitting a few experiments in the raising of produce, which may be improved upon by those better calculated, have more time, and are more devoted to the business of farming than I am. But to proceed to the experiments. Having purchased a small tract of poor land, near Wilmington, Delaware, which was overrun with the daisy, (or Richardson's pink,) and wishing to eradicate that pernicious weed as early as possible, I determined to work the ground hard, by a quick rotation of crops, taking care to lime and manure in proportion. After progressing in this way for a few years, it occurred to me that it might be worth while to ascertain the amount raised, and the value per acre, by the process I had adopted. The first lot of ten acres was treated as follows. In the fall I put on twenty-six loads of barn-yard manure to the acre, spread it evenly, and ploughed it in; after which it was well harrowed,and so left until spring, when it was again twice harrowed; the last time crosswise. It was then run out as near north and south as the field would admit of, and planted in drills, as follows, the first two rows three feet apart, the third row seven feet: the next three feet, and so on, alternately through the field. The object in planting every other row seven feet apart, was that it might have all the advantage of sun and air—but not wishing to loose too much ground, by planting so wide apart, I planted a row of potatoes in each seven foot space—the produce as follows: 500 bushels corn, at 60 cents, $300; and 500 bushels potatoes, sold at 50 cents, (exclusive of small ones,) $250. The corn was cut off in the fall, and shocked in the field, and the ground sown with wheat, (except where the shocks stood,) which was sown in the spring with millet. The produce was 300 bushels wheat, at $1 10 cents, $330. Millet 4 tons, with the seed, worth $16 per ton, $64. Directly after harvest the wheat stubble was ploughed in, and part of the field sown with turnips; the other part with buckwheat, produce 200 bushels buckwheat, which was sold at 50 cents, $100; and 600 bushels turnips, fed to the cattle, say at 25 cents per bushel, $150; in all, $1,194, independent of straw, fodder, &c. The field was then manured, and laid down in wheat, and sown with grass seed. The next experiment was on an adjoining lot of ten and a half acres, manured and tilled as the first, and planted in rows five feet apart one way, and two feet the other, and not exceeding three stalks in the hill, more frequently one and two; produce eighty bushels to the acre, at 75 cents per bushel, $130. The next spring it was ploughed, and planted in potatoes, in rows six feet apart, and manured in the row. I then struck out between the rows of potatoes, and planted corn two feet apart as above—the corn had no manure—produce as follows: 500 bushels sound corn, sold at 80 cents, $400; 1,500 bushels potatoes, sold from 30 to 37½ cents, say 35 cents per bushel, $525. The seasons of 1836 and 1837 were unfavorable for corn with us, and it ripened late. Part of the above field is in with wheat, sown in the fall, with a light dressing of compost—the residue in spring wheat, without manure; both look well. In endeavoring to be as brief as possible, I am apprehensive I have not been sufficiently explicit to be clearly understood.

Thy friend,
EDWARD TATNALL.

From the Farmers' Cabinet.

BURDON'S EXCELLENT OINTMENT.

Yellow rosin, the size of a hen's egg, to be melted in an earthen pot over a slow fire, to which add the same quantity of beeswax. When melted, add half a pound of hog's lard, and when that is dissolved add two ounces of honey and half a pound of common turpentine, and keep gently boiling a few minutes, stirring all the time. Take it off the fire, and when it has cooled a little, stir into it two ounces of verdigris finely powdered, then give the whole a few minutes' gentle boiling, and pour through a sieve for use. Nothing takes fire out of a burn or scald in human flesh so soon as this ointment.

I would suggest, that no store in a newly settled district ought to be without a plentiful supply of the above ointment for sale; it is equally good for cuts and bruises and putrefying sores, and might be denominated with propriety, *the universal remedy*.

JAMES PEDDER.

MONTHLY COMMERCIAL REPORT.

A drought of almost unprecedented duration, attended with excessive heat, has prevailed during the greater part of July and the first two weeks in August, and with the exception of a few recent showers, the drought still continues in this part of the country. It has prevailed far and wide—on the Atlantic coast and beyond the mountains—and the crops have suffered co-extensively. That of Indian corn, in some parts of the country, is almost a total failure; while in favorable situations, and where the drought was less severe, a fair crop will be made. Tobacco and cotton require less moisture; but without a long spell of favorable weather, they cannot attain their growth; and, from the failure of the plants early in the season, it is considered certain that the crop of tobacco will be far below an average one.

In those parts of the country where potatoes, flax, and clover are extensively cultivated, the failure of the crops will be severely felt. Our markets are not supplied with the ordinary vegetables of the season. The mills in many places are stopped, and the navigation of our rivers impeded or suspended. Some places have, during this period, been visited with violent storms, and great damage has been sustained.

The price of wheat gradually declined to $1 20 to $1 25; but has advanced recently to $1 30 and $1 35. The crops on tide-water have generally been disposed of; but those in the interior are now partially withheld from market, in consequence of an apprehended deficiency of corn. The last accounts from England exhibited little apprehension as to the result of the wheat crop there. Those from the north-western states represent the wheat crop as very abundant.

The inspections of tobacco in Virginia to 1st inst. amounted to about 39,000 hhds. Since then the supply gradually diminished, and has now nearly ceased. Prices have advanced, and may now be quoted $5 50 to $12 per 100 lbs. The export to Europe proceeds very slowly.

The receipts of cotton, since October last, are 1,804,000 bales, against 1,343,000 to the same period in 1837; and, considering this great increase, prices are well sustained; present quotation 9 to 11 cents. The accounts of the growing crop, in the south-western states, are favorable.

Indian corn has advanced, particularly in the northern markets, where 95 cents to $1 per bushel has been paid. Sales were recently made here at 80 cents.

The banks in the Atlantic states resumed specie payments on the 13th of this month; and no demands were made on them, except for inconsiderable sums required in ordinary transactions. Exchange on New York is at 1 to 1½ per cent. premium; on England 8½. X.

August 20, 1838.

Table of Contents of Farmers' Register, No. 6, Vol. VI.

ORIGINAL COMMUNICATIONS.

	Page
On the frequent failures of the wheat crop	321
Retarded action of gypsum	322
The spring wheat humbug—and remarks	335
New plan for dunning delinquent subscribers —Maryland twin corn	342
Remarks on the foregoing letter	343
Advantage of "swathing" wheat in reaping instead of "handing"	347
Selection of seeds	356
Capons	356
On the great raft in Red river	377
A first trial of silk-culture,	378
Monthly commercial report	384

SELECTIONS.

On pisé buildings	322
Beaver of North America	323
Marl (or limestone) of South Carolina	324
Capons	324
Ducks	325
Considerations upon the nature of the vegetables that have covered the earth at different epochs of its formation	325
Sixth annual report of the Portsmouth and Roanoke railroad company	330
Astonishing facts relative to a former organic world	334
Remarks on the propagation of the dahlia	337
Flowers, fruits, and trees	337
Anti-dry-rot	340
Templemoyle agricultural school	341
Hydrogen gas, in a lead-pipe used as an aqueduct	344
White washing trees	344
Oil-cake and bones exported from America	344
Abuses of bone manure	345
Harvesting of corn	347
Agriculture in France	348
A hint to cattle-breeders	348
Extended use of machines for grain	348
Notice of the Chinese treatise on silk culture	349
Chinese opinions and practices in mulberry culture	353
The silk culture in New Jersey	355
The morus multicaulis	355
Selection of seeds	356
Common school libraries	357
How to form a judgment of the age of a horse by his teeth	357
To prevent dogs sucking eggs	359
Manuring in South Carolina. Marsh grass, marsh mud, and leaf-littered cow-pens	359
The greatest quantity of manure from given means	361
Flemish husbandry	362
Bone manure	365
Pigeon roosts	366
On manure	366
English and American economy	372
The toad	373
Tame rabbits	374
Raise more poultry	376
Advice to farmers	376
The farmer	376
Important experiment in planting corn	376
Cob-meal and cob-mills	380
Management and diseases of hogs	381
Value of manure	383
Burdon's excellent ointment,	383